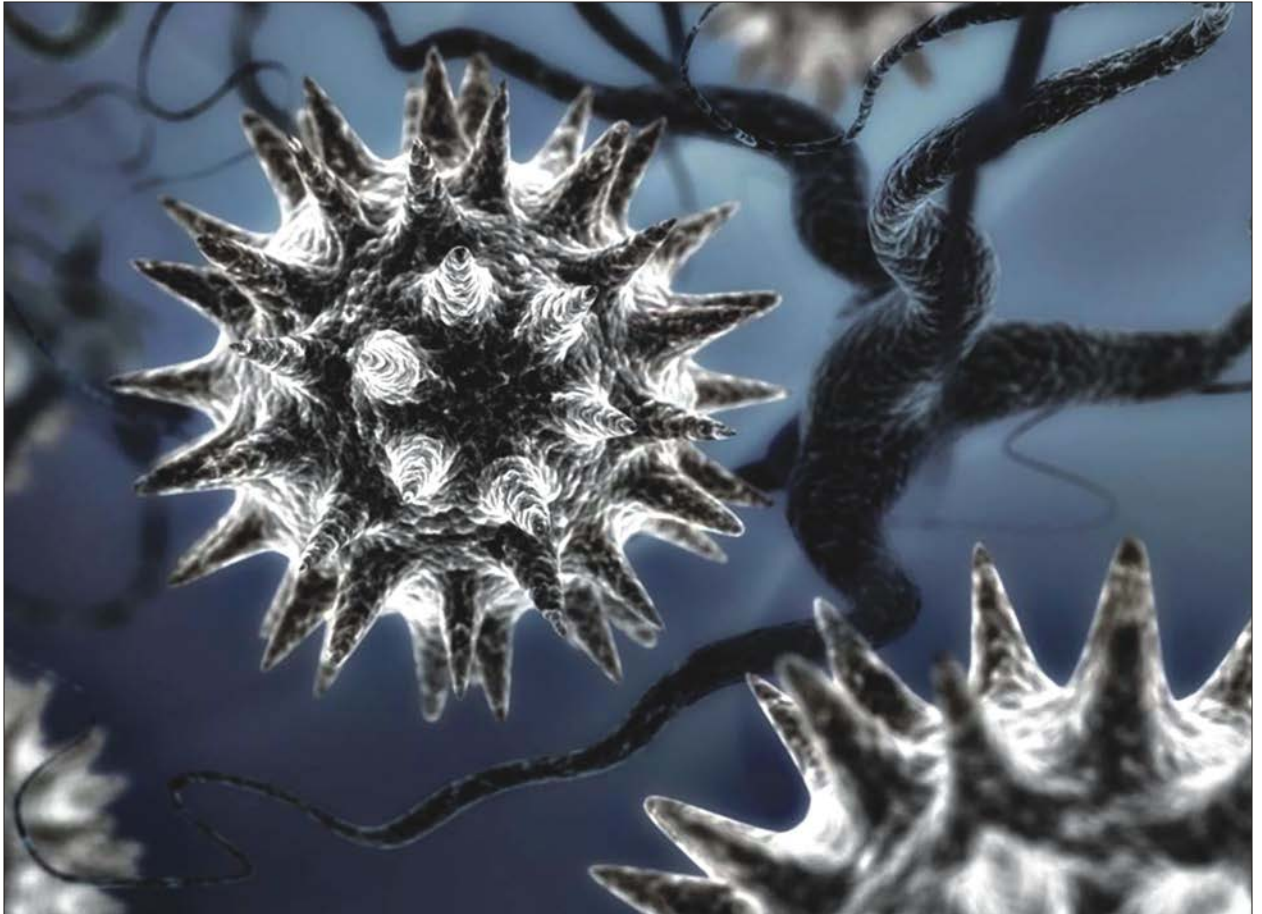




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Review on Crimean-Congo Haemorrhagic Fever in the World

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Abstract: Crimean-Congo Hemorrhagic Fever Virus (CCHFV) is an important human pathogen, which is the cause of a tick-borne illness occurring in different continent including Africa, Asia and Europe. CCHF could be seen as a sudden onset of high fever, chills, severe headache and gastrointestinal disorders, such as nausea, vomiting and diarrhea. Hemorrhagic manifestations can occur in severe cases too. The virus could be transmitted to human, when exposure to ticks, particularly those in the genus *Hyalomma*, happened, or direct contact with virus-infected animals or people who infected by virus. Unfortunately, many people are infected a cross the world and a few of them either as nosocomonal infection were died. At the present time no vaccine available to protect human or animal from infection. Only health measure has been recommended to prevent the infection. Supportive treatment also was recommended to management of the patient. This article reviews the history, epidemiology, ecology, clinical features, pathogenesis, diagnosis and treatment of CCHF.

Key words: Crimean-Congo hemorrhagic fever, CCHF, epidemiology, pathogenesis, prevention, treatment

INTRODUCTION

Crimean-Congo hemorrhagic fever (CC-HF) is caused by a virus that is widely distributed in wild and domestic mammals, birds and ticks in many regions of Africa, Europe and Asia (Fisher-Hock *et al.*, 1992; Estrada-Peña *et al.*, 2007; Midilli *et al.*, 2007). CCHF was first observed in the Crimea in 1944 by Russian scientists. The virus was first isolated in Africa from the Blood of a febrile patient in Zaire in 1956 (Gear *et al.*, 1982). Simpson *et al.* (1967) described 12 cases of a feverish illness with similar signs and symptoms of CCHF, of whom five were diagnosed as infection in the laboratory and the virus was isolated after inoculation of newborn mice with sera samples of infected patients. They were able to show that these viruses were serologically indistinguishable from the one isolated in 1956 and that this type of Congo virus was also similar to other virus strains from Central Asia, USSR and Bulgaria (Simpson *et al.*, 1967; Ali *et al.*, 2007). The virus has been classified as a *Nairovirus* genus from the family of Bunyaviridae. The virus contains RNA and is inactivated by lipid solvents and detergents (Papa *et al.*, 2002; Azazy and Scrimgeour, 1997). In Africa, the virus has been isolated from a variety of animals, including cattle, sheep, goats and from a number of ticks that parasitize them, including *Hyalomma* spp., *Hyalomma maginatum*, *Hyalomma anatolieum* and *Rhipicephalus* spp. (Burt *et al.*, 1996). In Iran, *Hyalomma* spp. probably plays the main role in transmitting the infection from animals to humans (Chinikar, 2002).

CLINICAL PRESENTATION

The disease is usually transmitted to following a tick bite, or through contact with the patient's blood or blood-contaminated specimens. Exposure to the blood of infected animals, especially cattle

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and sheep, has led to severe and often fatal infections. The incubation period for CCHF depends on the mode of transmission. It can extend from 2 to 7 days following a tick bite, or up to 10 to 14 days after blood transfusion or organ transplantation. The onset of the illness is sudden, with fever, chills, severe muscular pains, headache, vomiting and pain in the epigastric and lumbar regions. A hemorrhagic state develops from the third to the fifth day and manifests with skin petechiae or purpura and bleeding from the mucous membranes that manifests with epistaxis, hemoptysis, hematemesis, melena and hematuria. At this stage the conjunctiva is infected, face is flushed, tongue is dry, blood pressure decreases and heart sounds become weak. The liver is enlarged and tender and there is tenderness over the epigastrium and splenic region and even respiratory lesions and sometimes haemophagocytosis could be seen (Cagatay *et al.*, 2007; Tasdelen *et al.*, 2008). In patients who recover, the temperature decreases between the 10th and the 20th days and bleeding stops; however, convalescence can last up to 4 weeks or longer. In fatal cases, death from massive hemorrhage and cardiac arrest occurs 7 to 9 days after onset of the illness (Van Eeden *et al.*, 1985; Joubert *et al.*, 1985; World Health Organization, 2001). Crimean-Congo haemorrhagic fever also was involved with breastfeeding in babies (Erbay *et al.*, 2007).

DIAGNOSIS

The diagnosis is based on epidemiologic studies and clinical presentation. The diagnosis may be confirmed in a reference laboratory by detection of a rise in specific IgG or IgM titers using ELISA. (World Health Organization, 2001). Nowadays RT-PCR and other modern techniques has also been used to confirmed serological test of that infection (Duh *et al.*, 2008; Larichev *et al.*, 2007; Morikawa *et al.*, 2007; Engin *et al.*, 2008; Ozdarendeli *et al.*, 2008).

TREATMENT

Strict patient's management is required in many cases. Blood transfusion is mandatory in some cases too. Prescription of antiviral medication such as ribavirin either oral or IV prescriptions may show some benefit in established cases (Chinikar, 2002; Van Eeden *et al.*, 1985; Joubert *et al.*, 1985; World Health Organization, 2001) in some cases hematological support are necessary (Ergonul, 2007) if remains untreated could be fatal (Cevik *et al.*, 2007).

CONTROL MEASURES

No vaccine available for preventing of infection at present time. It has to be said, a suckling mouse brain, formalin-inactivated vaccine has been used in Bulgaria and other parts of Eastern Europe and the former Soviet Union. In the Rostov region of the former Soviet Union, 1500 persons received the vaccine and showed a high frequency of detectable antibody by the N test Likewise, vaccine was given to several hundred human volunteers in Bulgaria, with resulting high antibody induction. With the relatively small target population of persons at-risk for contracting CCHFV, the large-scale development and production of a CCHF vaccine by modern standards seems unlikely (Ivanov *et al.*, 2000; Mehrabi-Tavana, 2006; Gunes, 2006).

CONCLUSION

Different countries have been infected by the cchf in particular in Asia and Africa (Mehrabi-Tavana, 2006; Durrani *et al.*, 2008; Esen *et al.*, 2008) and a few cases also reported from Europe (Gunes, 2006). No vaccine available at present time for preventing the infection only health

measures could be effective to reduce the risk of infection (Mehrabi-Tavana, 2006). It should not be forgotten the disease also was seen as nosocomial too. High level of precaution must be considered in order to prevent the infection (Mehrabi-Tavana *et al.*, 2002).

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