Crimean—Congo Haemorrhagic Fever: A Real Threat to India

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Abstract

Tropical diseases are diseases that are prevalent in or unique to tropical and subtropical regions. Crimean–Congo haemorrhagic fever virus (CCHFV) of the genus Nairovirus of the family Bunyaviridae causes a zoonotic disease in many countries of Asia, Africa, the Middle East and south-eastern Europe. The disease was first described in the Crimea in 1944-45 when more than 200 cases of an acute, hemorrhagic, febrile illness occurred soldiers and given the name Crimean haemorrhagic fever. The CCHF virus is a member of the Nairovirus genus under family Bunyaviridae, which has four other genera, namely, Hantavirus, Phlebovirus, Orthobunyavirus, and Tospovirus. The onset of CCHF is sudden, with initial signs and symptoms including headache, high fever, back pain, joint pain, stomach pain, and vomiting. Red eyes, a flushed face, a red throat, and petechiae (red spots) on the palate are common. Symptoms may also include jaundice, and in severe cases, changes in mood and sensory perception. As the illness progresses, large areas of severe bruising, severe nosebleeds, and uncontrolled bleeding at injection sites can be seen, beginning on about the fourth day of illness and lasting for about two weeks. In documented outbreaks of CCHF, fatality rates in hospitalized patients have ranged from 9% to as high as 50%. There is no approved CCHF vaccine available and therapy is restricted to treatment of the symptoms. Health education and information on prevention and behavioral measures are most important in order to enhance public risk perception and, therefore, decrease the probability of infections. Thus the identification of endemic areas is crucial for focused and targeted implementation of public health measures.

Key words: CCHF, Haemorrhagic fever, Petechiae, Prevention, Tropical diseases.

Introduction

Tropical diseases are diseases that are prevalent in or unique to tropical and subtropical regions.[1] Today the world stand on the threshold of a new era in which billions of peoples will be safe from some of the most terrible diseases. On the other hand we stand on the brink of a global crisis in infectious diseases. No country is safe and no country can afford to ignore their threat any longer. Crimean-Congo haemorrhagic fever (CCHF) is a viral haemorrhagic fever caused by Nairovirus. Although it is primarily an animal disease, sporadic cases and outbreaks of CCHF affecting humans do occur. CCHF outbreaks constitute a threat to public health because of its epidemic potential, high case fatality, potential for nosocomial outbreaks, and difficulties in treatment and prevention. Crimean-Congo hemorrhagic fever a hemorrhagic fever caused by the Crimean-Congo hemorrhagic fever virus, transmitted by ticks and by contact with blood, secretions, or fluids from infected animals or humans; it occurs in the Crimea (Ukraine), Central Asia, and regions of Africa.[2-5]

The disease was first described in the Crimea in 1944-45 when more than 200 cases of an acute, hemorrhagic, febrile illness occurred soldiers and given the name Crimean haemorrhagic fever. In 1969, it was recognized that the pathogen causing Crimean haemorrhagic fever was the same as that responsible for an illness identified in 1956 in the Congo, and linkage of the two place names resulted in the current name for the disease and the virus.

The geographical distribution of the virus, like that of its tick vector, is widespread. The disease is endemic in many countries in Africa, Europe and Asia, and outbreaks have been recorded in Kosovo, Albania, Islamic Republic of Iran, Pakistan, and South Africa among other countries. Turkey has been known to be endemic for human CCHF and between 2002 and 2008, 2508 cases of CCHF with 133 deaths (case-fatality 5.3%) rate have been reported by the Ministry of Health of Turkey. Between 1 January and 30 June 2008 itself, a total of 688 confirmed cases have been reported in Turkey.

The recent outbreak of CCHF viral infection in Gujarat is the first notable report from India. The striking feature of this outbreak was high fatality and rapid spread among treating medical team.

Etiology: The CCHF virus is a member of the Nairovirus genus under family Bunyaviridae, which has four other genera, namely, Hantavirus, Phlebovirus, Orthobunyavirus, and Tospovirus.
Genus Nairovirus has:

1. Seven serogroups
2. 34 tick-borne species

Among these, only three members are known to cause disease in humans and they are:

1. CCHFV
2. Nairobi sheep disease virus,
3. Dugbe virus

Dissemination

Reservoir: Mammals, including hares, hedgehogs, rodents, and birds have been implicated as reservoirs of CCHFV; however, it is believed that they are more likely to be amplifying hosts rather than true reservoirs. Ticks of the Hyalomma spp. also act as a reservoir.

Zoonosis: CCHFV can be transmitted to humans via exposure to infected tissues/secretions during the slaughtering of infected animals, and via exposure to small-particle aerosols from infected rodent excreta. Zoonosis is also possible indirectly via infected tick bites.

Vectors: The Hyalomma species of tick are the most important vector for CCHFV. Other tick species vectors of CCHFV include Rhipicephalus, Ornithodoros, Boophilus, Dermatocentor, and Ixodes species

At-risk population

1. Animal herders, livestock workers, and slaughter houses in endemic areas are at risk of CCHF.
2. Healthcare workers in endemic areas are at risk of infection through unprotected contact with infectious blood and body fluids.
3. Individuals and international travelers with contact to livestock in endemic regions may also be exposed.
4. Age – all ages.
5. Sex – 3 times more in males than females.
6. Immunity – Life time immunity for that genome.

Mode of transmission

1. Bite of an infective adult tick, particularly Hyalomma marginatum or Hyalomma anatolicum.
2. Skin lesions when crushing an infected tick.
3. Nosocomial outbreaks due to exposure to infected blood and secretions.
4. Slaughtering of infected animals via small-particle aerosol from infected rodent excreta.
5. From contaminated needle sticks or infected fomites.
6. Drinking unpasteurized milk.
7. Sexual contact with infected person.
8. Horizontal transmission from a mother to child has been reported.
9. Ticks do not bounce, fly, bite and go like mosquitoes, they stay on the spot they hold onto for long periods.

Clinical Features: Course of this disease follows four distinct phases in humans:

1. Incubation phase
2. Prehemorrhagic phase
3. Hemorrhagic phase
4. Convalescence phase

Prehemorrhagic Phase

Prehemorrhagic phase is characterized by a:

1. Sudden onset of fever as high as 39-41°C, chills
2. Severe headache, myalgias, rash
3. Arthralgias, dizziness, photophobia
4. Back and abdominal pain

Additional symptoms such as:

1. Nausea, vomiting, diarrhea
2. Loss of appetite
3. Neuropsychiatric manifestations like violent behavior, psychosis, change in mood and confusion etc.
4. Bradycardia and hypotension

Hemorrhagic phase

1. In severe cases after 3-6 days of the onset of symptoms hemorrhagic manifestations occur. The spectrum of hemorrhages varies from petechiae to ecchymoses over skin and mucus membranes
2. Red eyes, flushing of face
3. Throat congestion and petechiae over palate
4. Epistaxis or dark coffee-colored vomitus due to hematemesis or tar-colored stools i.e. malena or hematuria
5. Bleeding from other sites like vagina, gum bleeds and intracerebral bleeds
6. Jaundice, hypovolumic shock, disseminated intravascular coagulation (DIC)
7. Prerenal failure and Lung failure
8. Multiorgan dysfunction syndrome (MODS)

Treatment

Treatment for CCHF is primarily supportive. Care should include careful attention to fluid balance and correction of electrolyte abnormalities, oxygenation and hemodynamic support, and appropriate treatment of secondary infections. The virus is sensitive in vitro to the antiviral drug ribavirin. It has been used in the treatment of CCHF patients reportedly with some benefit. Recovery the long-term effects of CCHF infection have not been studied well enough in survivors to determine whether or not specific complications exist. However, recovery is slow.[6]

Prevention

Agricultural workers and others working with animals should use insect repellent on exposed skin and clothing. Insect repellants containing DEET (N, N-diethyl-m-toluamide) are the most effective in warding off ticks. Wearing gloves and other protective clothing is recommended. Individuals should also avoid contact with the blood and body fluids of livestock or humans who show symptoms of infection. It is important for healthcare workers to use proper infection control precautions to prevent occupational exposure.[7]

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