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Transmission of Crimean Congo Haemorrhagic fever in cattle

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ABSTRACT

A severe threat to both human and bovine populations is the zoonotic disease known as Crimean Congo Hemorrhagic Fever (CCHF). Although direct contact with infected blood or bodily fluids can also transfer the virus, tick bites are the main way in which it is propagated. Because they can act as virus reservoirs and accelerate the virus's propagation. Cattle play a crucial role in the CCHF transmission cycle. To stop the spread of CCHF in cattle and safeguard public health, preventive measures like immunization, tick management, and biosecurity measures are required.

Introduction:

Crimean congo hemorrhagic fever is a zoonotic disease, that poses drastic consequences for human and bovine populations. Cchf is a challenge in areas where the virus spreads endemically. An in-depth study of the route of transmission is required to break the cycle [1, 3].

Epidemiology:

It is distributed all over europe (bulgaria, turkey, greece), asia (iran, pakistan, afghanistan), africa (sudan, nigeria, uganda), and, marshy areas. In historic times its distribution had been associated with environmental changes, war, and the trade of animals [2, 4].

Virus properties:

Crimean congo hemorrhagic fever virus belongs to the genus nairovirus, family bunyaviridae. Cchfv is a single-stranded, negative-sense rna virus having a segmented genome [5].

Transmission:

Hemorrhagic fever virus lives in animal hosts or arthropod vectors in the wild. Sheep and cattle are among the many domestic and wild animals that can contract cchfv. Tick bites carry the cchfv virus, which infects animals. Seroprevalence in animals ranges from 13% to 36% [10,11]. Circulate in nature in an enzootic cycle between ticks and vertebrates [5]. Over 30 species of *hyalomma* spp. Of ticks have a transovarial transmission as a maintenance mechanism. Crimean congo virus is mainly transmitted to ticks through the blood meal of the viremic host [7].

Life cycle of tick as vector of cchfv:

Oviposition and hatching of eggs. Larvae feed on small mammals and moulted to nymphs. Nymphs feed on small mammals and moulted to adults. Adults feed on livestock and humans where it transmits cchfv or gets infected (if livestock is already infected) [6].

Tick host interaction:

The tick acts as the main vector and reservoir of cchfv.

Within ticks, viruses can be transmitted by the transovarial route, vertical transmission (from larvae to adult), and limited by the venereal route [5]. Most ticks like *argasidae* eat for only 20–70 minutes, whereas *ixodidae* can feed for days or even weeks at a time [8]. A virus enters the tick's body through the blood meal of the infected animal. Viruses evade the immune system of ticks and reside in the gut, reproductive organs salivary glands of ticks and increase titer. Mutation of cchfv is more often in ticks rather than vertebrate hosts [5].

Transmission routes:

1. Tick bite transmission 2. Transovarial transmission 3. Transstadial transmission

Impact on cattle

Usually asymptomatic, the infection does not appear to cause any clinical hemorrhagic disease in livestock that is infected with cchfv [15]. The age of the animal and the cchfv infection rate differed significantly. The calves began to become infected with cchf after the age of two years, according to the assessment of age as a risk factor. At this age, the animals are typically let out to graze in the pasture, where they run the risk of coming into contact with an infected tick and contracting the cchfv virus [9,10,11].

Preventive measures

A multifaceted strategy is needed to prevent, and control transmission of the cchf virus in cattle, like: tick control, vaccination, biosecurity measures, public awareness and education

Human-cattle interactions and cchf virus transmission

Interactions between humans and cattle can help spread the cchf virus. Those who work closely with cattle, such as farmers and veterinarians, are more susceptible to infection. Humans can contract the cchf virus by biting an infected tick that has recently fed on an infected bovine or by coming into direct contact with blood or bodily fluids from infected cattle [13, 14]

Conclusion:

Crimean-congo hemorrhagic fever (cchf) is a serious health hazard that can infect animals or insects and spread to people. Because they can act as virus reservoirs and accelerate its spread, cattle are crucial to the cchf transmission cycle. To stop the spread of cchf in cattle and safeguard public health, preventive measures like immunization, tick management, and biosecurity measures are crucial. The world should focus on developing disease-resistant breeds as prevention is always better than cure.

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