Crimean-Congo haemorrhagic fever

Crimean-Congo haemorrhagic fever (CCHF) is a zoonotic, vector-borne disease caused by a virus in the Bunyaviridae family, of the genus Nairovirus. This disease affects humans and animals very differently. In humans, CCHF can vary from asymptomatic infection to severe haemorrhagic fever, with death occurring in up to 30% of severely ill patients. Many other species of mammals and some birds can be infected with CCHF virus, but clinical disease has not been described in any species other than humans. The occurrence of asymptomatic infection poses a significant challenge to national Veterinary Services in the prevention, detection and control of CCHF among animals.

Animals and ticks play a key role in the epidemiology and maintenance of CCHF virus. The natural cycle of the virus is associated mainly with ticks, predominantly those from the Hyalomma genus. Immature and adult stages of these ticks feed on small vertebrates (hares, hedgehogs and ground-feeding birds, among others) and large vertebrates (including cattle, sheep, goats, wild boar and ostriches), respectively. The majority of human cases are associated with a history of tick bite or unprotected exposure to biological fluids or tissues from infected animals or CCHF patients. Humans can also be exposed to CCHF virus through crushing the ticks that infest animals or exposure to the infective blood or tissues of animals. An increased circulation of the CCHF virus has historically been associated with ecological changes, particularly changes in land use and agricultural practices, that have resulted in the differential distribution of ticks, susceptible animal hosts and human contact.

The ad hoc Group on CCHF noted that, since 2004, there has been an increase in the number of documented human CCHF cases, occurring sporadically to hyper-endemically over the past decade, from countries in Eastern Europe, Central Asia, Russia and the Middle East. It is possible that increased public awareness and surveillance of CCHF are contributing to the increase in reported human cases. Current knowledge of animal infection with CCHF virus is limited and comes from investigations conducted during human outbreaks of the disease. There is potential for the CCHF virus to exist or be introduced into any area where Hyalomma ticks are found or could become established.

Crimean-Congo haemorrhagic fever was added to the OIE list of notifiable diseases in May 2005 (implemented January 2006). Member Countries must report the occurrence of CCHF in animals, in accord with the Terrestrial Animal Health...
Crimean-Congo haemorrhagic fever is also identified as a priority disease within the Global Early Warning and Response system for major animal diseases, including zoonoses (GLEWS), a network in which the OIE, the Food and Agriculture Organization of the United Nations and the World Health Organization have agreed to share official and unofficial information on the potential or confirmed occurrence of CCHF in animals or humans.

As of the end of February 2010, no immediate notification of CCHF infection in animals had been officially reported to the OIE, although six countries had reported the confirmed or suspected presence of CCHF in animals at least once, during the period from 2005 to 2009, in their six-monthly reports to the OIE. In the absence of specific OIE guidance on surveillance and diagnostic measures, reporting the disease and interpreting these reports remains a challenge. There is some suggestion that CCHF may be occurring among animals in some countries but it is either not identified or not reported. For example, there are countries in which human cases have been reported, yet no animal cases have been reported – even though animals play a crucial role in maintaining the presence of CCHF virus in a given area. In addition, there are reports in the scientific literature documenting animal or tick infections in countries that have not officially reported any animal infection to the OIE.

At present, experimental research on CCHF in animals is very limited

Crimean-Congo haemorrhagic fever was added as an OIE-listed disease due to its zoonotic potential. Viraemic animals are considered to pose a risk of blood-borne transmission to slaughterhouse workers and anyone slaughtering infected animals. Human cases have been associated with the slaughter of infected livestock, including ostriches. Additional risk factors for human infection include other kinds of direct animal contact (e.g. milking or sheep shearing). In slaughter or animal husbandry situations, it can be difficult to discriminate between tick exposure and blood-borne exposure as the transmission route for individual human cases.

At present, experimental research on CCHF in animals is very limited. This is, in part, due to the fact that there is no described disease in animals, but also to the high levels of biosafety concern about the CCHF virus, which is considered a Biosafety Level- (BSL-) 4 agent in most non-endemic areas, and a BSL-3 agent in several endemic countries. Crucial data are missing when attempting to describe natural infection with CCHF in animal species. It is challenging to fully characterise transmission risks and to identify comprehensive prevention and control measures. Acaricide treatment of livestock and, in special circumstances, of the environment,
has been implemented as a control measure. No clear data are available on the usefulness and efficacy of this procedure for preventing CCHF virus circulation and human disease.

Continuing collaboration between animal health and human health agencies on CCHF at all levels is crucial to its overall detection, prevention and control

There are many routes by which the CCHF virus could potentially be spread internationally. Infected animals are asymptomatic but capable of virus transmission. Therefore, there is a risk of spreading CCHF virus into a new geographic area through the introduction of infected livestock, other infected animals (wildlife or migrating birds) or infected ticks. If a viraemic animal is introduced into a previously unaffected area, where a local competent vector exists, transmission of the CCHF virus could occur and the virus could become established in the new area. The trade of animals infested with CCHF virus-infected ticks could also allow the introduction of the virus into a new area. Crimean-Congo haemorrhagic fever virus could become persistent in areas where either the tick vector exists or both a suitable habitat and preferred host are present. Acaricide treatment and implementation of a quarantine period would reduce the risk of international spread.

Crimean-Congo haemorrhagic fever is an important zoonotic disease, with substantial effects on humans and potentially severe impacts on trade. Unfortunately, the information currently available on the characteristics of CCHF infection in animals and its potential transmission to humans, as well as on host, pathogen and vector interaction, remains insufficient to serve as the evidence base for detailed OIE standards and guidance. Continuing collaboration between animal health and human health agencies on CCHF at all levels is crucial to its overall detection, prevention and control.

References