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HOW SIGNIFICANT ARE HORSES AND OTHER EQUIDS AS A SOURCE OF ZONOTIC DISEASES?

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It has been known since ancient times that humans could contract certain diseases from animals, including horses. In recent years, there has been a renewed interest in the importance of such diseases or zoonoses and of the need for greater cooperation between medical and veterinary professions in the fight against animal-borne illnesses that can ultimately affect humans. The "one medicine concept" involving a convergence of animal, human and environmental science professionals in the prevention of cross-species disease transmission is gaining increasing support.

An estimated 70 percent of infectious diseases of domestic and wildlife species has zoonotic potential and can, under certain circumstances, be transmissible to man. Notwithstanding the diversity of infectious agents involved, relatively few, however, are derived from horses or other members of the family *Equidae*. Most of the more frequently encountered zoonoses are contracted through direct or indirect human contact with other domestic species/wildlife. The goal of this presentation is to increase awareness of those diseases of equids that have zoonotic potential, to review their relative public health significance, and to provide information on selected equine diseases for which specific safeguards are needed to minimize risk of transmission to humans.

The range of diseases affecting the horse with zoonotic potential includes viral, bacterial, rickettsial, anaplasma, fungal and parasitic infections. Certain of these are listed by the International Office for Epizootic Diseases (OIE) as specifically equine diseases in that they normally do not affect other domestic species. Notable examples of diseases in this category would be the equine viral encephalomyelitides (Venezuelan, Eastern and Western equine encephalomyelitis), glanders and more recently, acute equine respiratory syndrome caused by Hendra virus (Table 1). Of additional zoonotic significance is the group of infectious diseases that are listed by the OIE as multispecies diseases and which can affect various domestic/wildlife species besides the horse. Examples of diseases in this category would be rabies, salmonellosis, anthrax and leptospirosis. Of the range of infectious diseases that can affect the horse and other equid species and which have zoonotic potential, some are of greater public health significance than others. Among the group of OIE listed equid diseases, Venezuelan, Eastern and Western equine encephalomyelitis and acute equine respiratory syndrome are associated with severe disease in humans that can be fatal. The same would apply to certain multispecies diseases such as rabies, anthrax and melioidosis. The etiologic agents of other diseases, e.g. salmonellosis, leptospirosis and Q fever, though they can be responsible for causing significant illness in man are usually not considered of equivalent public health importance. The perceived zoonotic significance of most of the diseases that can be transmitted from equids to man is influenced not only by the pathogenicity of the respective pathogens involved but also by the prevalence of cases of human infection. The causal agent of certain diseases such as acute equine respiratory syndrome, although transmitted very rarely to man, nonetheless is regarded of considerable zoonotic significance because the very high case-fatality rate reported to date. The route(s) of infection most frequently associated with transmission of various equine pathogens to man varies with disease. Many of the viral diseases are either vector-borne, e.g. Venezuelan, Eastern and Western equine encephalomyelitis, or are acquired by inhalation, e.g. vesicular stomatitis, or through inoculation of virus-infective material, e.g. rabies. Most of the bacterial infections on the other hand, are often contracted through inoculation (glanders), ingestion (salmonellosis) or inhalation (Q fever). In the case of selected diseases, e.g. acute equine respiratory syndrome, the route(s) of human infection has not been firmly established.

In summary, of the numerous infectious diseases of domestic species and wildlife, few are specifically equine diseases. Several equine diseases are, however, of major zoonotic importance. Significance ascribed to an equine zoonosis is dependant on prevalence of that

disease and its case-fatality rate in humans. Transmission of the more important equine zoonoses is vector borne.

Occurrences of zoonotic diseases such as West Nile virus infection and avian influenza in recent years serve to underscore the need for greater cooperation between human and animal medical science if more effective prevention and control of these diseases is to be achieved.

Table 1. Equid Diseases with Zoonotic Potential

Disease	OIE Listed Disease	Causal Agent	Zoonotic Importance	Likely Route(s) of Human Exposure
Venezuelan equine encephalomyelitis (VEE)	+	VEE virus subtypes 1A, 1B, 1C, 1D, and 1E	Highly significant when VEE virus 1A or 1C involved	Mosquito-borne
Eastern and Western equine encephalomyelitis (EEE, WEE)	+	EEE or WEE virus	Very significant, especially EEE	Mosquito-borne
Glanders	+	Burkholderia mallei	Significant	Inoculation, ingestion or inhalation
Acute equine respiratory syndrome	-	Hendra virus (bat paramyxovirus)	Highly significant, rare occurrence	Inoculation or inhalation?
African horse sickness (AHS)	+	AHS virus serotypes 1-9	Low significance, infrequent in laboratory workers	Inhalation during vaccine production
Epizootic lymphangitis	-	Histoplasma capsulatum var. farciminosum	Low significance, rare occurrence	Inoculation or ingestion
Horse pox	-	Horse pox virus	Low significance, rare occurrence	Direct contact
Equine granulocytic ehrlichiosis	-	Anaplasma phagocytophila	To be determined	Tick-borne?