ENCEPHALOMYELITIS IN HORSES

I. A. SCHIPPER
Professor of Veterinary Science
Agricultural Experiment Station
and
I. E. BERG
Associate Professor of Veterinary Science
Agricultural Experiment Station

COOPERATIVE EXTENSION SERVICE
NORTH DAKOTA STATE UNIVERSITY
FARGO, NORTH DAKOTA 58102

Reported outbreaks of Venezuelan Equine Encephalomyelitis (VEE) in horses and humans in northern Mexico and southern Texas in 1971 precipitated immediate warnings of possible spread of this disease to other states through transportation of horses. Other forms of equine encephalomyelitis have existed in the United States for many years. These ravished the horse industry in the late 1930's, but at present can be prevented through vaccination and insect control. Because VEE has not been previously diagnosed in the United States, horse and human populations are highly susceptible.

Venezuelan Equine Encephalomyelitis

VEE is caused by a virus serologically unlike those causing the North American types, Eastern equine encephalomyelitis (EEE) and Western equine encephalomyelitis (WEE). This disease (VEE) was first detected in Venezuela in 1938 and has since been reported in Brazil, Columbia, Equador, Mexico, Panama and Trinidad. The mosquito serves as the principle vector and, possibly, part-time reservoir. Domestic quadrupeds (sheep, cattle, goats) are important natural reservoirs of this viral agent. Birds, rats and other rodents may also serve as reservoirs. Because of widespread transportation of horses in this country, the infectious agent could be carried across the continental United States in a matter of days.

Signs in Horses

The first symptoms include elevated temperature. (103-105° F), loss of appetite and depression. Neurological signs follow because of brain damage. These include incoordination, drowsiness, hanging head, difficult swallowing and cross-leg-braced stance. The involved horse may walk in circles constantly and then go down. The body temperature is below normal as death approaches. In general, the symptoms are very similar to those observed for the North American types of equine encephalomyelitis, except that VEE may result in a fulminating, systemic disease that results in death of the horse before nervous signs are detected. The mortality rate of VEE approaches or exceeds 90 per cent. Differentiation of the diseases can be made only by a trained observer and by laboratory procedures in an adequately equipped and staffed facility.

Control will require vaccination of susceptible horses, mosquito control and avoidance of contact or importation from geographical areas of infection.

North American Equine Encephalomyelitides

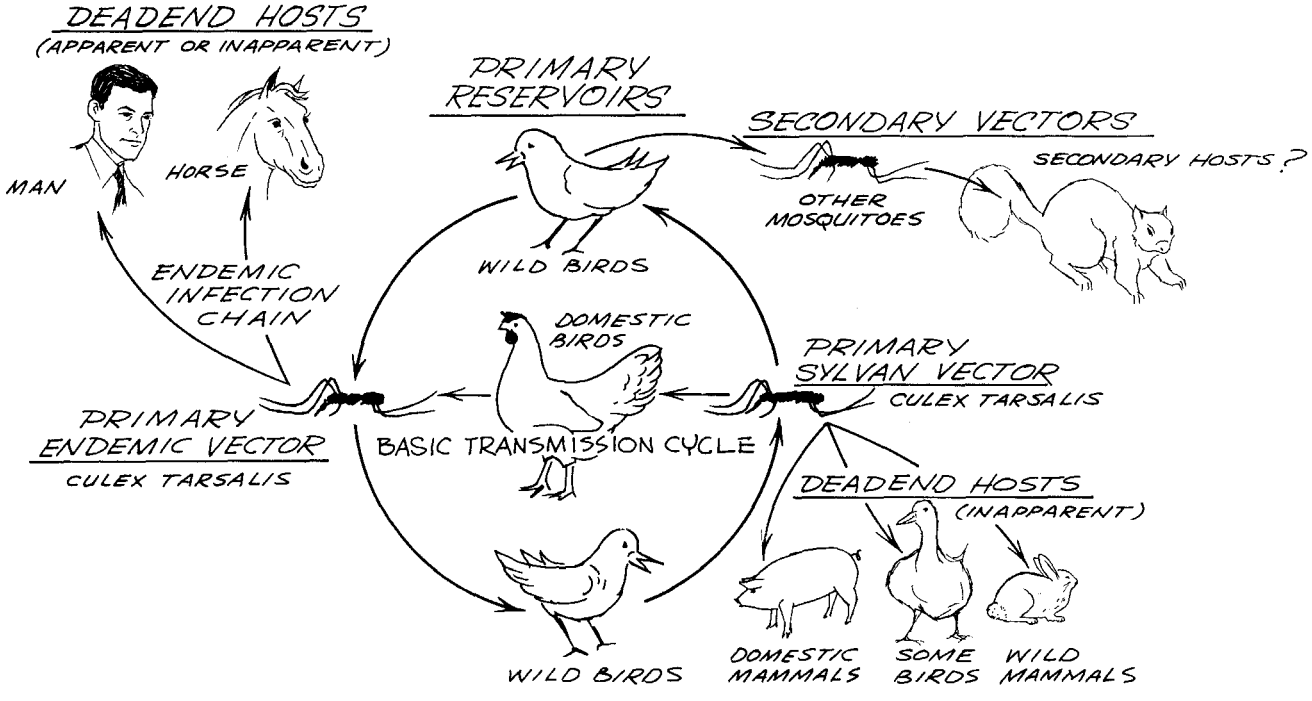
This group of diseases is characterized by similar clinical signs of nervous disturbances and high mortality, not unlike those described for VEE. Those most frequently associated with horses include WEE and EEE. They are commonly called "sleeping sickness" or "brain fever".

EEE occurs principally in eastern Canada and the eastern coastal and gulf states of the United States. The western form is principally found in western and central Canada, United States and Mexico. Because of modern transportation both the Eastern and Western viruses may be found anywhere in the United States. These diseases are more frequently observed in pastured than in stabled animals.

Spread is by Mosquitoes

The viruses of WEE and EEE multiply in the body of the mosquito and live in the salivary glands. While the virus multiplies in the mosquito, it apparently is not passed on to the young mosquito directly. The viruses are expelled from the mosquito upon skin penetration. Once infected, a mosquito remains so, probably for life.

Domesticated and wild birds serve as reservoirs for these viruses and are the most important source of mosquito infection. In fact, birds are actually the definitive or preferred host of the virus. Horses and man are accidental and unfortunate hosts. The virus has been isolated from chickens, ducks, geese, pigeons, pheasants, cardinals, blackbirds and turkeys. The virus is passed in the bird population by blood sucking insects in the same manner as it is passed to horses and humans. The mosquito, again, is primarily involved, but mites, lice and ticks have also been incriminated.



Horses, mules and man are victims of the disease but usually do not serve as a source of spread and are termed "dead-end" hosts. This is not true with VEE. In this disease, the virus population in the infected animal's blood stream is sufficiently high to permit animal-to-animal spread. Even the insect vector is not necessary in some cases. The North American encephalitides diseases occur most frequently in areas of large mosquito and bird populations.

Symptoms are Similar to Those Described for VEE

The initial signs include a temperature elevation of (102-107° F), depression, irregular gait and impaired vision. Circling, uncoordination, yawning, grinding of the teeth and a pendulous lower lip are other signs observed. Inability to swallow, paralysis and death are terminal symptoms. The case mortality rate is greatest in horses affected with the EEE - approximately 90 per cent.

Incidence is highest during the summer months and decreases sharply following the first killing frost. The well-nourished animal is most likely to recover. Age and sex apparently have no relation to incidence.

Prevention

A formalin inactivated vaccine for both WEE and EEE is available and will provide protection for at least six months. Horses should be vaccinated annually in the spring for both WEE and EEE, as each is caused by a different virus. Either vaccine alone will not provide protection against both viruses. Neither of these vaccines, alone or in combination, will provide protection against the VEE virus. Most of the products available in the United States are bivalent; that is, they immunize for both WEE and EEE.

Another means of prevention is adequate mosquito control or protecting horses from mosquitoes by stabling or repellants.

Humans May be Infected

Signs of WEE, EEE or VEE in humans are similar to those in the horse. Of the North American types, EEE is usually the most severe and WEE the least with nervous involvement very infrequent. VEE is usually not fatal. The symptoms in humans include those due to encephalomyelitis, fever and depression. Infection may be so mild as to go unnoticed. The incidence in horses is unrelated to the incidence in man. However, an outbreak in horses may indicate a potential increased incidence in man.

Other Viral Encephalitides

Japanese encephalitis is an east Asian disease that could be a biological war threat to the United States. Another encephalitic disease is observed in Europe and is known as Borna disease. This disease is spread by ingestion of the infectious agent.

St. Louis encephalitis is a wide spread disease in the United States, but is primarily a problem in humans. Though horses are infected, the infection usually occurs in a mild form and is usually undetected.

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