



Equine Infectious Anemia

TIM CORDES, DVM, AND CHARLES ISSEL, DVM, PHD

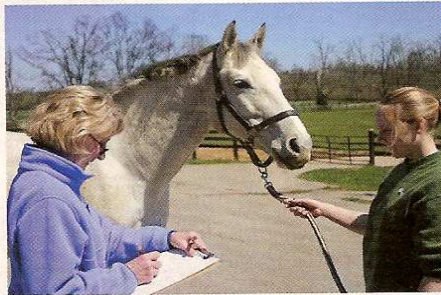
Equine infectious anemia (EIA) is a potentially fatal blood-borne infectious viral disease that produces a persistent infection among equids nearly worldwide. Although the disease has been recognized for centuries, its prevalence began to rise in the 1930s and reached its destructive peak in the United States between the '60s and '70s. In 1975, 10,371 cases of EIA infection were detected in the United States; many of these cases exhibited severe clinical signs, and some resulted in death.

The most common vectors for spreading EIA are biting flies, or tabanids, particularly horseflies. These large blood feeders can carry virus-bearing blood on their mouthparts from an infected horse to others.

If a horse becomes infected, the clinical signs of disease can vary dramatically, from an acute infection with slight to high fever for a few days and perhaps small hemorrhages, to progressive weakness, weight loss, depression, and disorientation. Some cases are characterized by rapid death, but EIA fatalities are not commonly encountered in the U.S. horse population today. There is no vaccine or treatment for the disease, and it is often difficult to differentiate EIA from other fever-producing diseases, including anthrax, influenza, and equine encephalitis.

The most commonly diagnosed form of the disease is the chronic form, in which the individual has repeated fever episodes and develops other clinical signs including dependent edema (swelling), weight loss, and severe anemia. EIA also has an inapparent form; affected horses might only show a slight fever for a day.

In horses with the chronic form of the disease, the virus takes up permanent residence in a horse's tissues, and he is always infectious to others, although the virus



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concentration in blood is much higher in horses with clinical disease.

EIA was difficult to diagnose and identify until 1970, when the agar-gel immunodiffusion test, commonly known as the "Coggins test," was developed. More recently, enzyme-linked immunosorbent assays (ELISA tests) reduced the time for a lab result from at least 24 hours to less than one hour. Accurate tests allow us to identify and remove positive reactors from herds and effectively block the spread of EIA among tested populations. Categories of horses that require testing include:

- Equids being entered into exhibitions or competitive events;
- Equids being moved interstate;
- Equids entering the United States;
- Equids changing ownership; and
- Equids entering horse auctions or sales.

Today the wide availability of the EIA tests, laws and regulations that control movement of equids, and universal precautions taken to avoid spreading contaminated blood to other horses have reduced EIA disease incidence to a manageable level. Horse population losses in the United States dropped from thousands a year in 1975 to negligible losses in 2010.

EIA, though, is still a threat. The virus

is categorized as a retrovirus: It contains RNA genetic material, which it uses to produce DNA. This DNA is then incorporated into the genetic makeup of infected cells. A dangerous characteristic of the EIA virus is mutation: The virus genome mutates relatively rapidly, allowing the virus to escape immune surveillance because of its new antigen identity.

This identity change makes EIA virus particularly difficult to control, both in individual equids and in populations, for two reasons. First, an effective vaccine would require a relatively stable antigen pattern to confer immunity. Second, a virus mutation inside an individual equid could cause an inapparent disease carrier to quickly become very ill and significantly more infectious. In addition, the virus appears to become more virulent as it is passed from one horse to the next.

Furthermore, not all equid populations are tested regularly. This increases the chances that the virus could be lurking in reservoirs in an unknown number of inapparent carriers that have not yet been identified through testing.

Finding these "hidden cases" and separating them by 200 yards from other animals at least can allow us to make headway against the spread of the EIA virus. Also, it can reduce costs for dedicated owners who have tested their horses on a regular basis. A video package on EIA has just been produced by USDA, and the streaming videos are available at www.aphis.usda.gov/animal_health/animal_diseases/eia/.

ABOUT THE AUTHORS

Tim Cordes, DVM, is the senior staff veterinarian with USDA APHIS Veterinary Services' National Veterinary Accreditation Program. **Chuck IsSEL, DVM, PhD**, is the Wright-Markey Chair in Equine Infectious Diseases at the University of Kentucky's Gluck Equine Research Center.