



Leptospirosis Can Cause Abortion in Mares

by **HEATHER SMITH THOMAS**

The Disease

Leptospirosis affects most species of mammals. It can be mild or serious, depending on the strain (serotype) of leptospira bacteria that causes it. In horses, the disease itself is mild, but can have serious side effects, such as periodic ophthalmia ("moonblindness"), kidney disease, hemolytic anemia (destruction of red blood cells) or abortion in mares.

Leptospirosis is caused by a spiral shaped bacteria. All leptospire are now classified into one species, *L. interrogans*, containing over 100 serotypes. The most common cause of lepto in horses, cattle and swine is *L. interrogans* serovar pomona.

Lepto is often spread by a carrier animal that had the disease but recovered, yet is still shedding bacteria in bodily secretions or excretions (saliva, nasal discharges, urine, semen, etc.) If a sick or carrier animal urinates in a water supply, susceptible animals may pick up leptospire from the contaminated water. Ponds and marshes are prime sources of infection.

The bacteria can live for many days in damp or saturated soil, but die within a few hours on dry soil. Lepto is not very contagious in dry climates or in dry seasons. The most common carriers are rodents, though some types of lepto are also spread by dogs, pigs, cattle or wildlife.

In horses, lepto may cause fever, depression or lack of appetite. Some horses will have jaundiced mucous membranes. In many cases the illness is so mild that it goes unnoticed. But there can be undesirable side effects

that show up later, such as moonblindness or abortion.

A vaccine was developed in the 1950's for the most prevalent serovar pomona, to protect cattle and swine against abortion. A five-way vaccine is now used (against canicola, grippotyphosa, hardjo, icterohaemorrhagiae and pomona), given annually to cows and pigs. Cattle in many areas of the U.S. are routinely vaccinated, but as yet there is no lepto vaccine approved for horses.

Abortion in Mares

Lepto abortions have been a problem for a long time, but were not always recognized. In recent decades, with improvements in diagnostic techniques (such as blood tests, tests on tissue samples from aborted fetuses, placental membranes and fluids, etc.) lepto abortions are more readily diagnosed.

For many years, a definitive diagnosis was often difficult, due to complexity of the tests and to the fragile nature of the leptospire—tissues from fetuses that had been dead for more than 24 hours, or frozen, could not be used for diagnosis. Testing the mares for blood titers was of little value, since a high proportion of horses already have antibody titers. The fluorescent antibody test (FAT) was used with success in detecting leptospire in equine tissues (such as aborted and stillborn foals), but it wasn't until the late 1980's that new materials and methods made it easier to use for general diagnostic work.

The Livestock Disease Diagnostic Center (University of Kentucky, Lexington) has been studying lepto abortions since 1988, using this new method, and others, to determine the prevalence of lepto abortions and still-

births in central Kentucky. They have been testing specimens from all equine abortions, stillbirths and neonatal deaths submitted to the LDDC.

Lepto is More Common Than Once Thought

Many mares who abort, have titers for lepto but this merely shows they have been exposed to the disease at some point and carry antibodies in their blood. Many healthy horses, who never had obvious symptoms of lepto, show antibodies when their blood is tested thus suggesting they have come into contact with the disease. Surveys show the disease to be endemic (prevalent at all times) in most horse populations.

Several horse farms in Idaho were experiencing lepto abortions in the 1960's, and ranchers in the Lemhi valley began using cattle vaccine on pregnant mares to prevent the loss of foals. Even though the cattle vaccine is not meant for horses, and its use is controversial, it will prevent lepto in horses and is still the only available weapon that works. Some veterinarians continue to recommend it in situations where leptospirosis is causing unusually large instances of periodic ophthalmia or abortion.

Horsemen are learning that equine leptospirosis is much more widespread than previously thought. It has been a significant cause of abortions in central Kentucky, according to researchers at the Livestock Disease Diagnostic Center in Lexington. From 1988 to 1995, the LDDC diagnosed 131 cases of equine lepto abortion, along with seven more cases during the spring of 1996. A peak number of abortions (50) occurred in the winter of 1993/94, then dropped to five each in 1994 and 1995.

Most horses in central Kentucky have blood titers against at least one leptosero type.

Researchers found that raccoons were passing the grippotyphosa serotype to horses, through urine contamination of feed and water. But they still have not discovered the source of infection for the more common kennewicki, which is a member of the pomona serogroup.

Most equine leptosero abortions during 1988 through 1993 occurred in November, December and January, but during 1994 to 1996, more abortions occurred in January, February and March. Dr. James M. Donahue of the LDDC feels the difference is related to exposure—these are the months the mares are being exposed to the infection (from wildlife or other sources). Climate conditions, horse management practices or the behavior of wild animals might play a role in the upsurge of abortions at various times of year. Dr. Donahue stated that most of the abortions in the eight year study were caused by the serovar kennewicki (closely related to pomona). Host animals for kennewicki are unknown, but hosts for pomona include cattle, swine, skunks, raccoon, deer, opossum and horses.

Abortion may be the only sign of a leptospirosis infection, since the disease may go unnoticed. Males and non-pregnant females can be infected (shedding leptospires in urine or other secretions, which may infect other animals) but show no outward signs themselves.

When horses get leptosero, they generally develop a mild to moderate fever seven to 10 days after exposure, at which time the bacteria can be cultured from blood samples. The leptospires then appear in the urine and may persist (being shed in urine and possibly infecting other horses) for up to 120 days. Moonblindness may occur up to 15 months later. Abortion in a mare usually occurs any time after the sixth month of pregnancy.

If the horse owner is aware the animal is ill, tetracyclines should be given as soon as possible after signs appear. Treatment can control infection and

keep the animal from shedding leptospires in body secretions and urine (thus shortening the time the animal is a "carrier", making it safe for it to be with a group).

Studies at the LDDC show that leptospires can be cultured from the urine of aborting mares, and that mares experiencing a leptosero abortion can be a potential source of infection for other mares for at least 25 days after aborting. The fetal and placental tissues are also a source of infection—if other mares in the pasture come sniffing around an aborted fetus they may become infected.

Broodmares that abort, tend to develop permanent immunity against that particular serovar and will not abort again, unless infected with another type. However, not all pregnant mares that contract leptosero abort. Some give birth to full term healthy foals, a few have weak premature foals that die soon after birth, while others have full term foals that are weak and ill, dying within a few days. Leptospirosis can be a cause of early death in young foals.

Prevention of leptosero in other animals (cattle, swine and canines) can be readily accomplished with vaccination, but as yet no vaccine has been approved for horses. Dr. Donahue of LDDC says that if the numbers of equine abortions seen in 1993 had stayed that high, there would be a lot of interest in an equine vaccine. He added that in 1993, a number of vets and farm managers went to a vaccine company to ask them to produce one, but were told the market wasn't large enough. Production of an equine vaccine in the future will hinge on demand—economics is the pivotal factor.

Meanwhile some horse men are using cattle vaccine. Many vets don't recommend it, since the vaccine is not made for horses. Until an equine vaccine appears (if ever), horse owners and veterinarians will have to weigh the advantages of vaccinating—protection against abortion and other side effects—against the possible risks. At this point the risks are unknown, since there hasn't been enough use of the cattle vaccine in horses on a large enough scale to determine what the dangers might be.

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