



Vesicular Stomatitis (VS)

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Summary

Vesicular Stomatitis (VS) is a reportable viral disease of horses, donkeys, mules, cattle, swine, and New World camelids throughout the Western Hemisphere. Disease is characterized by painful vesicular and crusting lesions and can occur in individual animals or as an outbreak.

Clinical Signs

- Vesicle formation that rapidly progresses to ulceration
- Ulcerative stomatitis, with the tongue being the most severely affected area
- Ulceration of the mucocutaneous junction of the lips
- Crusting of the muzzle and nares
- Excessive salivation
- Difficulty prehending and masticating feed
- Coronitis, often with lameness

Less frequent clinical signs:

- Lesions on the udder or prepuce
- Crusting lesions of the internal ear pinna
- Slow healing wounds secondarily infected with vesicular stomatitis virus

Note: VS is a reportable disease in all states. Alert state and federal animal health officials to any suspected case of VS. Movement restrictions are likely to be applied to affected premises. While VS itself generally causes low mortality, lesions can be clinically indistinguishable from Foot and Mouth Disease, and as such, VS is considered an emergency reportable disease in most states.



Transmission

Vesicular stomatitis virus (VSV) is considered an arbovirus because it uses insect vectors as the primary means of transmission. Evidence of arthropod transmission of VSV is most compelling for black flies, sand flies, and *Culicoides* species. Other insect species may also be competent biologic and mechanical vectors of VSV.

Propagation of VS outbreaks may be enhanced by movement of infected horses and spread by direct contact between infected and uninfected mammalian hosts. VSV is frequently isolated in vesicular fluid and from direct swabs of ruptured vesicles. Animals with active vesicular lesions have been shown capable of transmission by direct contact, shared feed/water sources, and other fomites contaminated by infective lesions, vesicular fluid, and/or saliva.

Diagnostic Sampling, Testing and Handling

- Laboratory testing is required to confirm VSV infection. Diagnosis is made through serologic testing and/or virus identification from samples of lesions.
- Suspected VS cases are required to be reported to state and federal animal health officials and samples must be submitted to the National Veterinary Services Laboratories (Ames, IA or Plum Island, NY) or to an approved National Animal Health Laboratory Network laboratory that has been specifically activated during an outbreak.
- Practitioners collecting samples under state or federal animal health officials' direction or performing necropsies in the field are encouraged to contact one of these VS-approved veterinary diagnostic laboratories in order to be certain they collect appropriate samples and handle them in a manner that will maximize the probability of a definitive diagnosis.

Post-mortem Findings

Mortality from VS is rare. Horses may be euthanized due to secondary complications, e.g., not drinking or eating due to painful oral lesions, colic due to feed impaction precipitated by inadequate water consumption, or nonsteroidal anti-inflammatory drugs precipitating secondary renal failure if hydration is not maintained during treatment.



**Shedding of Virus
Following
Resolution of
Clinical Signs**

The release of official quarantine of confirmed VS cases is based on resolution of lesions as the risk for virus transmission is considered minimal after lesions have healed.

Treatment

Treatment goals are largely supportive and depend on the location and severity of the lesions. Horses with oral lesions may require soft feeds. Non-steroidal anti-inflammatories may be administered to reduce pain associated with eating. Feed intake and water consumption should be monitored closely. Antibiotics should only be considered with evidence of secondary bacterial infections.

Vaccination

There is currently no licensed commercially available vaccine in the United States for control of VSV.

Protection from Insect Exposure

Protecting horses from insect exposure during outbreaks of VS may reduce the risk of clinical disease.

- Housing horses indoors or providing access to a covered shed during the daylight and dusk periods when insect vectors are most active
- Use fans to promote air circulation in stables
- Regular application of insect repellants to the horse including the inner surface of the ears (location black flies may feed)

**Environmental
Persistence**

Arboviruses generally use vertebrates as reservoirs for transmission by arthropods. Serologic evidence of exposure to VSV has been shown in many vertebrate species, however the reservoir of VSV between outbreaks that occur periodically in the southwestern and Rocky Mountain regions of the United States is unknown. Overwintering of the virus within eggs and larvae of competent insect vectors is suspected to play a role in continuation of a VS outbreak in subsequent years.



Specific Control Measures and Biosecurity Recommendations

Implementation of biosecurity practices to limit the spread of VSV is indicated. See AAEP [Biosecurity Guidelines](#)

- Wearing of disposable examination gloves when working with affected horses followed by hand washing is indicated.
- Eye protection is indicated when examining affected horses. VSV can cause flu-like symptoms and stomatitis in humans with exposure potential from saliva and vesicular fluid from affected horses.
- Restriction of movement of affected horses and herd mates is important in control of spread of the virus and mandatory quarantine will be placed on confirmed affected premises by state or federal animal health officials.

Requirements for New Arrivals to Facility or Event

During VS outbreaks, there may be additional entry requirements for horses that have been in regions where disease has been confirmed to reduce risk of VSV introduction.

- Certificate of veterinary inspection (CVI) with a specific statement related to any recent potential exposure to VSV
- Inspection of newly arriving horses including an oral examination to detect vesicles or ulcers. Wear disposable examination gloves and personal protective clothing. Change between horse examinations.

Release of Animals from Quarantine

Quarantine release is determined by state or federal animal health officials. Release of VS cases and their herd mates is based on a specified number of days after onset of lesions in the last affected animal on the premises.

Biosecurity Issues for Receiving Quarantine-Released Animals

Once horses are released from quarantine, no additional precautions should be required, although continued application of vector control measures is recommended in VS-affected areas during an outbreak.

**Zoonotic Potential**

There is evidence of human exposure to VSV resulting in illness through laboratory work and through working with affected animals. In humans, VS is an acute, self-limiting infection. Common symptoms include fever, myalgia, headache, and fatigue lasting 3-5 days. Vesicular lesions have been documented to occur rarely in humans exposed to VSV. People, especially immunosuppressed individuals, handling confirmed, or suspected cases of VS should be diligent about using personal protective equipment including face shields, gowns, and gloves.

Findings from an outbreak of VS in Colorado suggested a higher risk of seropositivity was observed in people who examined the oral cavity of infected animals and had open wounds on their hands or arms, and those who examined horses rather than cattle.

Additional Resources

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/equine/vsv/vesicular-stomatitis>

References

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