



SWINE VESICULAR DISEASE

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Domestic pigs and wild boars	Direct contact, feeding of infected meat, less common faecal transmission, possible transmission from humans harbouring the virus	Fever, lameness and vesicles followed by erosions in the mouth and on the snout, feet, and teats; all indistinguishable from FMD, in addition an unsteady gait, shivering, and chorea due to an encephalitis	Less than 5%	None	<i>In houses</i> <i>in zoos</i> Serological monitoring system, strict importation restrictions, no garbage/meat feeding

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Susceptible animal groups Domestic pigs and wild boars are the only natural hosts. Baby mice have been experimentally infected. Sheep will develop antibodies.	
Causative organism Swine vesicular disease virus (SVDV) is a spherical 28 nm single-stranded RNA enterovirus in the group of picornaviruses and is closely related to the human enterovirus Coxsackie B-5 and unrelated to known porcine enteroviruses.	
Zoonotic potential There have been accidental laboratory infections of humans. People can harbour the virus in their nasal passages and there is also anecdotal evidence that in one case SVDV was transferred to pigs through the eating of human faeces.	
Distribution Swine vesicular disease (SVD) was first reported in Italy and was subsequently recognized in Hong Kong, England, Scotland, Wales, Japan, Malta, Austria, Belgium, France, the Netherlands, Germany, Poland, Switzerland, Greece, and Spain. Outbreaks in the 1990's were reported in Italy, Spain, and Portugal.	
Transmission Primarily through contact with infected animals or by feeding garbage that contains SVDV infected meat. Most commonly, the disease is spread by introducing infected animals into a naïve population. Recent outbreaks in Europe appeared after the introduction of animals that had no clinical sign of SVD, which indicates that there is a subclinical form of the disease. Mucosal injuries enhance the ability of the virus to infect animals. Faecal transmission is uncommon, which is unusual for an enterovirus. SVDV is resistant over a wide pH range (2.5-12) and can survive up to 38 days in a pH range of 3.9-9.1 at 4°C. SVDV is relatively resistant to heat (inactivated at 69°C), and persists for a long time (up to 2 years) in salted, dried, and smoked meat products. It has been found in the gut of earthworms that had contact to buried SVDV infected pigs demonstrating its ability to survive in the environment.	
Incubation period Usually 2 to 3 days after eating contaminated feed and 2 to 7 days after contact with infected pigs.	
Clinical symptoms Clinical signs are very similar to those of foot-and-mouth disease and other vesicular diseases. The acute form of SVD is characterized by fever, lameness and vesicles with subsequent erosions in the mouth and on the snout, feet, and teats; lesions which are grossly indistinguishable from FMD. Morbidity in SVD is lower,	



and lesions are less severe than in foot-and-mouth disease. There is essentially no mortality in SVD. An unsteady gait, shivering, and chorea-(jerking)-type leg movements due to an encephalitis are more suggestive of SVD. The inapparent form of SVD is characterized by antibody development only.

Post mortem findings

Vesicles are indistinguishable from those of foot-and-mouth disease, vesicular stomatitis, and vesicular exanthema of swine. Primary viral replication takes place in the stratum spinosum of the snout, lips, gums, tongue, and coronary band. Following hydropic degeneration and oedema, keratinocytes in affected areas become spherical (ballooning degeneration) and float into the vesicular fluid. The stratum basale remains intact. A nonsuppurative meningoencephalitis affecting primarily the cerebrum, thalamus, brain stem and olfactory lobes and a necrotizing myocarditis and endocarditis have been reported.

Diagnosis

Differential diagnosis for SVD should include foot-and-mouth disease, vesicular stomatitis, vesicular exanthema of swine, and chemical and thermal burns. The range of affected species may help in the diagnosis of vesicular diseases. If only swine are affected other differentials include swine pox, pseudorabies, and classical swine fever. Vesicular fluid samples are tested by complement fixation (CF) or an antigen capture ELISA test. Virus isolation should be performed to confirm the diagnosis. Serology is complicated by cross-reactions with other undefined porcine enteroviruses.

Material required for laboratory analysis

The following should be collected from each of two or three animals:

1. Vesicular fluid (as much as possible).
2. Epithelium covering a vesicle.
3. Flaps of epithelial tissue still attached. Don't collect old necrotic or fibrinous material that is difficult to remove, because it is often highly contaminated with bacteria.
4. Heparinized blood (viremia ends about 5 days after the onset of disease).
5. Serum (10 ml of serum).
6. Full set of tissues in formalin.

Collect material from vesicles in sterile glycerol phosphate buffer solution. The virus persists for at least a week in tissues of the snout, tongue, coronary band, tonsil, cardiac muscle and central nervous system and these tissues should be collected fresh and also be fixed in formalin. Heparinized blood should be collected for virus isolation and serology.

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Treatment

There is no treatment for SVDV infected pigs. There is essentially no mortality, however infected pigs may harbour the virus for a long time posing a potential threat for other animals. A clinical appearance similar to foot-and-mouth disease causes significant diagnostic problems and is the main reason for strict eradication of the disease.

Prevention and control in zoos

Control measures will be assisted by avoiding feeding of SVDV infected meat, having an effective swine identification system, and using serological surveys targeted primarily to breeding sows to detect subclinical infections. Strict importation restrictions must be applied to pigs and pork products originating from countries where SVD is present to prevent outbreaks. Garbage feeding must be stopped or carefully regulated to



insure proper cooking. Temperatures of 70°C for a minimum of 60 min inactivate the virus.

Suggested disinfectant for housing facilities

SVDV is inactivated by cresol, sodium hydroxide (2%), formalin (1%), sodium carbonate (4% anhydrous or 10% crystalline, with 0.1% detergent), ionic and non-ionic detergents, strong iodophors (1%) in phosphoric acid, lipid solvents such as chloroform, examples of effective disinfectants: potassium peroxymonosulfate (Antec Virkon S at a dilution rate of 1:100); hypochlorites (bleach, Chlorox (The Chlorox Company) at a dilution rate of 1:32 (only in the absence of organic material, disinfectant properties of sodium hypochlorite are inactivated by organic material and diminished by alkaline materials (lime) and moisture, contact with skin is irritating), phenols and related compounds, e.g. cresols, 1 Stroke Environ® (Calgon Vestal), Tek-Trol (Bio-Tek Industries, Inc.) at 1-2% concentrations, not inactivated by organic debris, disinfectant properties are enhanced by warm temperatures, and diminished by cold temperatures and moisture, contact with skin is corrosive and the use of goggles and rubber gloves is recommended.

Notification

Yes.

Guarantees required under EU Legislation

Guarantees required by EAZA Zoos

Measures required under the Animal Disease Surveillance Plan

Measures required for introducing animals from non-approved sources

Measures to be taken in case of disease outbreak or positive laboratory findings

Conditions for restoring disease-free status after an outbreak

Contacts for further information

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