Swine Vesicular Disease
Summary

Introduction

1. This note provides a brief summary of an analysis undertaken by a DISCONTOOLS group of experts on Swine Vesicular Disease (SVD). They reviewed the current knowledge on the disease, considered the existing disease control tools, identified current gaps in the availability and quality of the control tools and finally determined the research necessary to develop new or improved tools. Full details of the analysis can be downloaded from the web site at http://www.discontools.eu/ by selecting Disease Database, then the specific disease and highlighting the variables of interest. This is completed by selecting "create a report" which can then be downloaded as either a PDF or Excel spread sheet.

Disease profile

2. SVD virus is a member of the genus *Enterovirus* within the family *Picornaviridae*. Analyses based on full genome sequences support the hypothesis that SVD virus originated around 1960, from recombination between the human pathogens coxsackievirus B5 and another Enterovirus B serotype, most likely coxsackievirus A9. Swine (domestic and wild pigs) are the only susceptible species. SVD has become a milder condition than previously and can be easily missed. It is possible that outbreaks are not reported unless severe clinical signs resembling foot-and-mouth disease (FMD) are seen. SVD does not cause serious production losses but surveillance, control and eradication measures are costly. Nowadays, the impact of SVD is low, morbidity is low and mortality nil. Excretion of the virus in faeces rarely exceeds 3-4 weeks but the virus may persist in the environment for much longer periods.
3. Due to the frequent subclinical nature of SVD virus infection and the lack of information on surveillance, the global distribution of the virus cannot be ascertained with certainty. At present, in many countries absence of SVD is based on absence of clinical disease. Since SVD has often a sub-clinical course, clinical surveillance must be supported by appropriate sampling and laboratory investigations such as serological surveillance, which can be supplemented with detection of SVD virus in pen-floor faeces in farms where serological positive pigs are found and/or with an epidemiological link to an outbreak.
4. Apart from rare clinical cases in Europe, SVD has been endemic in southern Italy with Campania and Calabria not yet officially free. Clinical cases are very rare but virus has been sporadically detected in these regions during laboratory investigations conducted in compliance with an intensive monitoring programme. Occasional outbreaks or rarely epidemic waves of infection have spread into northern regions of Italy (last case in 2007), from where SVD virus has been rapidly eradicated.

Risk

5. The risks of transmission are associated with the movement of pigs or contaminated materials and transport vehicles from countries where the disease is not diagnosed due either to inadequate surveillance systems or to sub clinical occurrence.

Diagnostics

6. Currently available diagnostic tests are well validated. The 5B7-competitive ELISA for antibody detection reported in the OIE manual underwent extensive validation in several EU National Reference laboratories, before being considered as the reference screening test. Currently, two Companies commercialize an ELISA kit for detection of antibodies, which are based on the same principle and perform very similarly to the 5B7-competitive ELISA. Reagents for antigen detection based on ELISA and for antibody detection by 5B7-competitive ELISA (as described in the OIE manual) are available from the two OIE reference laboratories.
7. Extensive experience suggests that for antibody detection ELISA may be more reliable and robust than Virus Neutralisation Test (VNT), so that there is no need to confirm multiple positive samples detected by ELISA with the VNT. VNT, however, remains the reference test to confirm singleton reactors identified by ELISA. Similarly, the conventional RT-PCR reported in the OIE manual proved to be more sensitive and reliable than virus isolation (indicated as the gold standard test). Extended sequencing of isolates would help in selection of best matching primers for application in new real-time RT-PCR assays.

Vaccines

8. There is currently no commercial vaccine available against SVD and vaccination is not permitted in EU. Stamping out infected herds only has been the main strategy in Europe and was effective. There has never been a need for the use of SVD vaccine although experimental studies show they work.

Pharmaceuticals

9. There is no need for pharmaceuticals to cure or control SVD.

Knowledge

10. The disease was included among the OIE lists due to the similarity of clinical SVD to FMD. At present, SVD infections are often subclinical and therefore unapparent. In case of clinical disease, the current laboratory diagnostics can effectively discriminate between FMD and SVD. Full details of the gaps are shown in the Disease and Product analysis for Swine Vesicular Disease on the DISCONTOOLS web site.

Conclusions

11. The main importance of SVD has been that it is clinically indistinguishable from FMD, and any outbreaks of vesicular disease in pigs must be assumed to be FMD until investigated by laboratory tests and proven otherwise. Because good diagnostic tests are available for this purpose and because the worldwide incidence of clinical SVD has diminished, the importance of SVD has decreased. It remains to be seen, whether or not, delisting of SVD by OIE and consequent reduction in surveillance and control efforts will result in the viral agent becoming more prevalent, and if so, if this will be associated with any changes in disease expression.