EPIDEMIOLOGICAL OUTBREAK INVESTIGATIONS IN CLASSICAL SWINE FEVER OUTBREAKS IN GERMANY

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Outbreaks of classical swine fever (CSF) or hog cholera, even solitary outbreaks, cause tremendous economical losses for agricultural and related industries, especially due to very stringent trade restrictions. Therefore, sufficient epidemiological enquiries become more and more essential[1]. The major objectives of such investigations are halting the progress of the disease, determining the reasons for the outbreak, instituting corrective measures, and recommending procedures to reduce the risk of future outbreaks[2].

Materials & Methods

An epidemiological advisory group of the Institute of Epidemiology of the FRCVDA has been involved in the epidemiological outbreak investigations usually in case of outbreaks in newly affected areas or in cases of CSF outbreaks with a higher risks of spreading.
A special designed questionnaire with about 20 (A4) pages has been developed in order to ensure the appropriate collection of all relevant data and to standardize the procedure of questioning. After first information was given by local veterinary authorities, the epidemiological outbreak investigations were carried out in following main steps:

1. Questionnaire investigation on the infected premise including visiting the farm and surroundings,
2. Interviews in the neighbourhood and contact farms, talks to veterinary practitioners, animal dealers, hauliers, rendering plants, animal feed companies etc.,
3. Cross-check of the collected data of different sources,
4. Verifying of data in case of discrepancies by re-visiting,
5. Creating a hypothesis of the source of infection and possible risks of spread as conclusions.

Since 1993, the epidemiological advisory group was requested for tracing investigations in 53 CSF outbreaks. The results of these tracing investigations were compared with the first information about the source of infection available immediately after official confirmation of the outbreaks by the local veterinary authorities.

Results

With respect to the farm size, the investigated farms varied between 4 and 62.500 pigs. Comparing the production purpose, 17% were of breeding farms, 43% were mixed farms and 40% were fattening farms. The portion of primary outbreaks of the investigated farms was 32,7%. The results of the outbreak investigations are presented in Table 1.

Source of infection	Assumed source within 24 hours after confirmation	After outbreak investigation
unknown	33 (62,3 %)	12 (22,6 %)
contacts via persons, vehicles or by the neighbourhood	9 (17 %)	20 (37,7 %)
animal movement	5 (9, 4 %)	5 (9, 4 %)
garbage feeding	4 (7,5 %)	8 (15,1 %)
contacts to wild boar	1 (1,9 %)	8 (15,1 %)
others	1 (1,9 %)	0

Table 1: Results of outbreak investigations in 53 CSF outbreaks in Germany between 1993 -1999

Discussion

Although the number of outbreaks with an unknown source of infection could be decreased after the outbreak investigations, 22,6 % of the investigated outbreaks remained with an unclear source of infection. One reason for this sometimes was a lack of information on the farm due to not recognising the early clinical signs of CSF by the farmer, or the inability of the agricultural industries, like feeding suppliers or rendering plants to provide adequate data in the right order in the past. Some farmers hesitated to provide the right information or were not able to support the investigators with sufficient data.
Indirect contacts like contacts via vehicles, persons or objects between the infected premises and other farms usually occur between a considerable number of pig holdings. But the virus will be transmitted only in a few cases. Therefore, different risk categories for contacts via persons or vehicles are necessary. For example, persons with close contacts like surgical operations or ear tagging are transmitting the disease much more effective than farmers visiting each other. The neighbourhood

contacts were considered as contacts between neighboured farms with no further explanation about the kind of contact except that is the neighbourhood within the 1 km surrounding to the affected holdings. Especially, pig farms located in the radius of 250 m of an CSF outbreak are highly endangered to receive the CSF infection as one study showed[3]. Therefore, the collection of contact data should be expanded at least to the maximum incubation period prior to the estimated date of entry of the agent into the affected holding. The detected contact farms should be blocked for animal movement, clinically inspected by veterinarians and in case of suspicious animals serologically and virologically tested as soon as possible.

Data about animal movement from and to the farms are more readily available at present due to the obligation of farmers to store all referring data in special farm registers. A identification system on herd level is in place and all pigs are marked with ear tags. Nevertheless, the contacts via purchasing of pigs are the most important contacts and should be traced very carefully. Contact holdings receiving live animals from infected premises or pigs transported with the same lorry should be immediately blocked and blood samples should be taken from all introduced animals.

Garbage feeding is a special issue in smaller mostly fattening farms. On one hand, the farmers were aware of the feeding ban but on the other hand there was a lack of compliance by some farmers.

Direct contacts between infected wild boar and domestic pigs were never observed. The indirect contacts are often postulated but are seldom validated. As a rule, in cases of an outbreak among domestic pigs within a wild boar infected area, the genetically determination of the same virus type the surrounded wild boar population and the absence of other infection routes, than an indirect transmission coming from infected wild boar was often assumed. Data of CSF surveillance in wild boar populations are essential for the assessment of possible links between wild boar and domestic pigs.

Questionnaire investigations and other epidemiological enquiries should be carried out on the affected farm as soon as possible, already in case of a reasonable suspicion. Enquiries are easier at the beginning, and farmers are more willing to co-operate in the early stage of the disease control procedure.

Outbreak investigations should be carried out at least with several persons and if possible in different groups. Veterinary authorities, especially at higher administrative level, should have experienced epidemiologists in specialized in epidemiological outbreak investigations, in order to ensure rapid investigations with collection and evaluation of data to stop a possible spread, and eradicate the disease.

References

[1] Schimansky, K, Seidler, MJ: Epidemiologische Ermittlungen bei Ausbruch der KSP; ein Erfahrungsbericht, Amtstierärztlicher Dienst und Lebensmittelkontrolle, 1996, Vol. 3, pp. 166 -172

[2] Martin, SW, Meek, AH, Willeberg, P: Epidemic diseases: Outbreak investigations, In: Martin, SW, Meek, AH, Willeberg, P eds., Veterinary Epidemiology, Principles and Methods, Ames, Iowa State University Press, 1988, pp. 283-291

[3] Staubach, C, Teuffert, J, Thulke, HH: Risk analysis and local spread mechanisms of classical swine fever, In: Epidemiol. sante anim. Paris, 1997, no. 31-32, pp. 06.12.1-06.12.3