A comparison of early pathogenesis of CSFV-Glentorf and CSFV-Romania in Danish pigs

A comparison of early pathogenesis of CSFV-Glentorf and CSFV-Romania in Danish pigs

Introduction: Classical swine fever (CSF) is an infectious disease of many forms. Crucial factors for the clinical outcome of infection include strain virulence and host characteristics such as pig age, microbial health status and genetic background. In the presented experimental animal study, we inoculated young conventional Danish pigs with two different strains of CSFV: One strain originating from Romania (Romania TM/120/07) characterized to be medium to high virulent, and one strain of German origin (Glentorf) to be low virulent. Thirty pigs were divided into three groups to be intra-nasally virus-inoculated with a dose of 105 TCID50/pig (2x10 pigs) or mock-inoculated with Eagle’s medium (1x10 pigs). All pigs were closely monitored for clinical illness in a clinical scoring (CS) system [1] and body temperatures were recorded every day with both rectal digital thermometer and an electronic body monitoring system. Antibiotic treatment was instituted at PID10 in all three groups for 5 days. Blood samples were collected at predetermined days for laboratory examination. Pigs were sequentially killed with representatives from each group within the first, the second and the third week, to follow pathological progress and virus distribution within the body of the individual pig. Results: Clinical profile: The control pigs and the Glentorf-infected pigs had body temperatures within normal range for the whole experimental period. The Romania-infected pigs developed fever from PID5 with mean temperatures between 40.0 and 41.0°C. From PID10-PID14, the mean temperature increased to above 41.0°C. Mean CS for control pigs was ≤1, while the Glentorf-infected pigs had a mean CS of ≤4. Both groups experienced problems with soft feces from PID2, and the Glentorf-infected pigs showed further slightly depression and loss of appetite PID9-10. Antibiotic treatment had a beneficial effect on these two groups, and clinical symptoms resolved after 1-2 days of therapy. For the Romania-infected pigs, CS increased throughout the experiment from PID6 with mean CS=3 until termination of the experiment with mean CS=19 at PID18. Clinical symptoms in this group were dominated by diarrhea, lethargy, changed body shape, coordination problems and further on respiratory symptoms and ataxia. Antibiotic therapy had no effect in this group. Virus distribution: Control pigs were all negative by RT-PCR analysis for CSFV. In Glentorf-infected pigs, CSFV RNA was found in blood samples of 6/10 pigs. Three pigs killed PID5 were all negative. In Romania-infected pigs, CSFV RNA was found in blood samples of 10/10 pigs. Further virological data will be presented at the meeting. Pathological observations: By post-mortem examination, a pathological score (PS) [2] was obtained for each pig. The mean PS for each group was calculated for the individual weeks. For the control group, PS was equal to zero in all three weeks. For the Glentorf-infected pigs, PS was 2-3 in all three weeks. For the Romania-infected pigs, PS was 3.7 in week 1, and then further increased to 12 and 12.8 in week 2 and week 3, respectively. Conclusion: An experimental animal study comparing two different CSFV strains in young Danish pigs was performed. The characterization of the two strains by clinical appearance, virus distribution and pathological examination in the two groups of pigs correlated well with earlier descriptions in pigs with a different genetic profile and microbial health status. Further characterization of the Glentorf strain and other strains of low virulence will be of considerably interest in our strive for diagnostic tools in assisting early detection of CSFV infection. Attention is drawn to the fact that the unspecific symptoms experienced in the Glentorf-infected pigs with soft feces and slightly depression responded well to antibiotic treatment, where after no difference in the clinical appearance of the Glentorf-infected pigs contra the control pigs could be detected. Acknowledgements: The authors wish to thank the EU Reference laboratory for Classical Swine Fever, TIHO, Hannover for kindly supplying the CSFV-Romania and the CSFV-Glentorf strains to our Institute. A special thank to Dr Olaru, NRL, Romania for supplying the Romania TM/120/07-strain to the EU Reference laboratory. References: [1] Mittelholzer C. et al., Vet Microbiol 74, 293-308 (2000) [2] Floegel-Niesmann G. et al., J Vet Med B 50, 214-220 (2003)