

EMERGING AND RE-EMERGING PIG VIRAL DISEASES AND INFECTIONS: WHAT CAN BE EXPECTED IN THE FUTURE?

Joaquim Segalés

Departament de Sanitat i Anatomia Animals, Universitat Autònoma de Barcelona and Centre de Recerca en Sanitat Animal (CRESA, IRTA-UAB), Campus de la Universitat Autònoma de Barcelona, 08193 Bellaterra, Barcelona, Spain

Emerging infectious diseases (EID) are characterized by increasing incidence following its first introduction into a new host population or in an existing one as a result of long-term changes in its underlying epidemiology. This concept also includes those diseases linked to pathogens expanding into an area in which were not previously reported, or those that changed significantly its clinical-pathological presentation. The number of novel conditions in swine included under the concept of emerging and re-emerging diseases has increased significantly during last 20-30 years. Most of them are infectious diseases, being those of viral origin of great importance. Their transmissibility and maintenance into a population is favoured by a number of phenomena, including intensive rearing practices and globalized/international trading.

Besides those novel or re-emerging pathogens able to cause disease, there are a number of newly discovered viruses for which no evidence disease association does exist. For example, from 1985 to 2010, novel pathogen species (all types) were identified at an average annual rate of 3 in pigs. The advent of modern diagnostic and research methodologies, sometimes without the need of previous knowledge about the putative pathogen (i.e., high throughput sequencing), has increased significantly the number of microorganisms that are infecting animals. In consequence, a complex scenario with novel infectious agents with unknown importance is being faced nowadays by researchers and veterinarians.

The objective of the present review is to discuss about new swine diseases or novel presentations of already known diseases, as well as newly recognized infections with an unknown pathogenic effect in pigs. Such scenario implies to play with certainties and uncertainties, since last 30 years taught us about:

- The emergence of global diseases for which there is still not a clear definitive solution (i.e., porcine reproductive and respiratory syndrome)
- The emergence of global diseases for which the pathogen existed long before, but overt disease was only recognized recently (i.e., porcine circovirus 2-systemic disease)
- The emergence of global diseases for which the pathogen has apparently varied in virulence (i.e., porcine epidemic diarrhea)
- The emergence of diseases that were not geographically expected in certain parts of the world (i.e., African swine fever in the Russian Caucasus and now in China)
- The recognition of putative novel viruses for old diseases (i.e., atypical porcine pestivirus as cause of congenital tremors type AII)
- The discovery of viruses that were not novel but considered potential causes of zoonosis (i.e., hepatitis E virus)
- The discovery of viruses that were not novel with unknown outcome related with its infection, although considered to be harmless (i.e., torque teno sus viruses)
- The discovery of viruses from which we do not have idea about its disease potential, if any (i.e., porcine circovirus 3)

The list of new recognitions, identifications and discoveries is much longer and will definitively increase in the future. Can we predict the impact of these new viruses?