

Congenital tremor Type A-II in newborn piglets is caused by transplacental transmission of a novel pestivirus

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Introduction: Congenital tremor is a well-known phenomenon in newborn piglets. It is characterized by tremors of the head and limbs that vary in severity, but are reducing or even absent during sleep. They last for several weeks to months but decrease in severity as the pigs grow older. Historically, congenital tremor has been classified as type A, with defined pathological characteristics and partially known etiology, or type B, with unknown etiology. Type A is further divided into five subgroups, based on the different causes of congenital tremor and pathological characteristics. Congenital tremor type A-II remained the most puzzling subgroup, but has been regarded as a transmissible disease since the 1970's, probably caused by a virus. So far the virus involved remained elusive.

Materials and Methods: A next generation sequencing platform, VIDISCA (Virus discovery cDNA-AFLP) together with Roche-454 nucleotide sequencing was used to identify a possible novel virus. Serum samples from diseased piglets were compared with samples from healthy piglets. A quantitative RT-PCR was set up for rapid identification of all variants of the identified virus so far, based on amplification of a conserved region of the virus in the 5'UTR. Gilts were experimentally inoculated with serum from infected pigs.

Results: We identified a novel pestivirus in serum of piglets with congenital tremor in 2012. In the 2012-2015 period, several variants of this pestivirus were discovered on eight farms that are periodically affected by the disease. Piglets on two farms with no history of congenital tremor type A-II were negative for the virus. The virus was found in 83 out of 83 piglets with clinical signs of congenital tremor A-II. In order to demonstrate the causal relationship between pathogen and disease, three gilts were experimentally infected with the virus at day 32 of gestation. In two of the three litters born from these gilts, several piglets presented with mild to moderate clinical signs of congenital tremor type A-II, while piglets of one litter were symptom-free. Exactly the piglets born in this last litter were all free of the novel pestivirus, whereas the piglets with clinical congenital tremor type A-II from the affected litters were all positive for the virus.

Conclusion: We conclude that transplacental transmission of the new pestivirus, which we propose to be named congenital tremor associated porcine pestivirus (CT-APPV), is causing congenital tremor type A-II in piglets. We are now setting up serological and PCR analyses to further investigate the prevalence of CT-APPV in the Dutch pig population, and the effect on farm performance parameters.

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