

Identification of a pestivirus in piglets with congenital tremors and reproduction of disease following experimental inoculation

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Congenital tremors, also known as myoclonia congenita, “shaker pigs” or “dancing pigs” is a sporadic but not uncommon affliction in newborn pigs which has been recognized for over 90 years. Several causes, including hog cholera virus, have been associated with this disease, but in the last 40 years the etiology of this condition in the US has remained a mystery in most cases.

In collaboration with Boehringer Ingelheim Vetmedica, researchers at the Iowa State University Veterinary Diagnostic Lab (ISUVDL) recently identified a novel virus in piglets with congenital tremors using next generation sequencing and quantitative real-time PCR (qPCR). The virus was detected by qPCR in samples from neonatal piglets with congenital tremors from four separate farms, but not in samples from unaffected piglets from the same farms. When first discovered, the virus had closest genetic relatedness to a bat pestivirus; however it has still closer relationship to a recently published novel porcine pestivirus. This novel pestivirus is different and distinct from the very distantly related virus of hog cholera.

When this novel porcine pestivirus was experimentally inoculated into developing fetuses, those piglets were born with typical and often severe tremors (manuscript submitted for publication). Experimental inoculation was accomplished by intranasal and intravenous administration to sows simultaneously with ultrasound-guided inoculation of fetal vesicles at either 45 or 62 days of gestation. One sow and litter was sham-inoculated as a negative control. Neither clinical signs nor viremia were detected in sows; however, all sows inoculated with the novel pestivirus farrowed some or all piglets affected with congenital tremors whereas sham-inoculated piglets were unaffected. The prevalence of congenital tremors in pestivirus-inoculated litters varied from 57% (4 of 7 piglets affected) to 100% (10 of 10 piglets affected; [click to see video](#)). The virus was consistently detected by qPCR in tissues from piglets with congenital tremors but was not detected in sham-inoculated piglets. Sample types that were positive by qPCR in greater than 90% of piglets sampled included brainstem (37 of 41), mesenteric lymph node (37 of 41), tracheobronchial lymph node (37 of 41), and whole blood (19 of 20).

This is the first report whereby experimental inoculation with a novel pestivirus reproduced clinical disease identical to that found in naturally-occurring field cases. However, little is known of prevalence, epidemiology or pathophysiology of this novel agent in US swine. Efforts to propagate the virus, develop serology tests and to characterize clinical impact of this newly-discovered virus within US swine herds are ongoing.

Currently, the ISUVDL is offering a qPCR to detect the virus in sample types which include serum, whole blood, central nervous tissue, and lymph nodes. Please contact the ISUVDL if you have questions (515-294-1950, <http://vetmed.iastate.edu/vdl>, isuvdl@iastate.edu).