RESEARCH ABSTRACT

SWINE HEALTH

Title: Understanding and searching for immune protection against group C rotavirus in piglets - **NPB # 13-065)**

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Scientific Abstract

The proposed study was designed to address if maternal/lactogenic immunity correlates with protection against rotavirus C-associated disease in piglets as well as ontogeny of antibody response to various vaccine forms in old pigs. Two animals studies were conducted for this purpose.

The first animal experiment involved passive transfer of rotavirus-specific IgG to mimic the maternal immunity in neonates and assess if the level of maternal antibody correlate with protection against oral challenge of rotaviruses. CDCD piglets were fed concentrated IgG raised against a porcine rotavirus C isolate right after birth along with milk replacer. Rotavirus-specific antibody was detected by both ELISA and SVN test in sera one day after oral feeding. While ELISA antibody gradually declined over a 4-week period post feeding, SVN antibody disappeared rather quickly between 1 and 2 weeks after feeding. Upon challenge, all pigs developed diarrhea between 24 and 48 hours post inoculation regardless of serum antibody titers. However, the severity of diarrhea, level of virus fecal shedding and degree of villous atrophy were less in IgG receiving pigs than control pigs. Such protective effect against challenge were not apparent after week 2 post feeding. Some degree of heterologous protection was observed in IgG group within 1-week post feeding as compared to control group but was not statistically significant.

In the second animal experiment, the ontogeny of antibody response of pigs after receiving experimental rotavirus vaccines (cell-culture derived live virus, ice cubes containing rotavirus-positive feces, recombinant VP7) was characterize in attempt to estimate the level of material antibody passively transferred to piglets via colostrum. Both live virus and recombinant antigen were able to mount antibody response in naïve 5-week-old pigs which was measurable by ELISA and SVN test. Oral administration of live virus (i.e., feedback) induced lower SVN antibody titers than intramuscular injection of 2-doses of adjuvanted recombinant VP7. Oral administration of live virus, however induced loose stool to mild diarrhea with fecal shedding of the virus in the inoculated pigs. Although VP7 recombinant protein induced a higher SVN antibody titer, such neutralizing activity was subtype-specific and less effective on heterologous strains.

In conclusion, study observations suggest that: a) naïve pigs could develop serum antibody response with neutralizing activity when they were given a low dose of live virus orally or injected with a recombinant viral protein; b) neutralizing antibody response appeared to be subtype-specific (i.e., G type); 3) orally fed IgG could reduce the severity of disease by rotavirus but not infection.