Mink (Neovison vison) kits with pre-weaning diarrhea have elevated serum amyloid A levels and intestinal pathomorphological similarities with New Neonatal Porcine Diarrhea Syndrome - DTU Orbit (13/10/2019)

Mink (Neovison vison) kits with pre-weaning diarrhea have elevated serum amyloid A levels and intestinal pathomorphological similarities with New Neonatal Porcine Diarrhea Syndrome

Background: Pre-weaning diarrhea (PWD) is a syndrome affecting farm-raised neonatal mink kits. Apart from diarrhea it causes greasy skin exudation, dehydration, and distressed behavior and can ultimately lead to death. No specific causative agents have been identified and the syndrome is regarded as multifactorial. The aim of the present study was to investigate a possible inflammatory state in mink kits with PWD, as indicated by raised serum concentrations of the acute phase protein serum amyloid A (SAA) and by changes in intestinal pathomorphology and intestinal contents of bacteria. Samples collected from 20 diarrheic mink kits with PWD and 20 age-matched non-diarrheic control mink kits from two commercial Danish farms during the pre-weaning period (April-May) in 2016 were analyzed.

Results: Concentrations of SAA in serum samples from mink kits with PWD were significantly higher (up to 1000-fold) compared to non-diarrheic control mink kits. Significant features of enterocytic vacuolization, atrophy and fusion of villi in jejunum and mucosal atrophy of the colon of kits with PWD were found. Moreover, attachment of coccoid bacteria to enterocytes was more often found in kits suffering from PWD, while intra-cytoplasmic eosinophil bodies were more frequently observed in control kits. Cellular infiltrations with mononuclear and neutrophil leukocytes were not associated with disease status. Bacteria from the Staphylococcus intermedius group, such as Staphylococcus delphini, were more frequently cultivated from control mink kits, whereas Enterococcus spp. dominated in mink kits with PWD. Escherichia coli was cultivated from both control and mink kits with PWD, but with a higher frequency from mink kits with PWD.

Conclusion: A significant increase in circulating concentrations of SAA was found in PWD affected mink kits from 6 to 23 days old compared to controls. The histopathological changes in PWD mink kits suggest that the type of diarrhea is secretory. Attachment of coccoid bacteria, therefore, might be responsible for an enterotoxic effect causing a loss of balance in movements of ions and water leading to the vacuolization and swelling of the enterocytes. The slight to moderate infiltrations of neutrophils irrespectively of diarrheic status and the attachment of coccoid bacteria to enterocytes are comparable to observations found in piglets suffering from New Neonatal Porcine Diarrhea Syndrome. Mechanisms behind the correlation between increased SAA levels and the observed pathological intestinal features remain obscure.

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