MODULATION OF LOCAL IMMUNE RESPONSE AS A BENEFICIAL STEP IN REDUCTION OF CAMPYLOBACTERIOSIS IN CHICKENS

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Introduction: *Campylobacter* sp. is a zoonotic foodborne pathogen causing acute gastroenteritis in man. Chickens are a natural host for *Campylobacter* spp.. The aim of the trial was to follow intraepithelial lymphocytes (IELs), lamina propria lymphocytes (LPLs) in the caecum and sIgA, MUC1 and MUC2 in intestinal flushes of the caecum in chickens after *Lactobacillus fermentum* application and challenge with *Campylobacter*.

Materials and Methods: One-day-old chickens ($n = 120$) were divided into groups ($n = 30$): control (C), *L. fermentum* (LB), *Campylobacter* (CB) and combined *L. fermentum* + *Campylobacter* (LBCB). *L. fermentum* was administered individually per os to chickens during the first 7 consecutive days. Chickens were infected with *Campylobacter* spp. at 4 days of age.

Results: Determination of caecal IELs and LPLs demonstrated an increase in $CD8^+$ IELs ($P < 0.001$) and LPLs ($P < 0.01$) at 4 dpi in the LBCB group; at 7 dpi the increase was observed only in the LB group. Intraepithelial $CD3^+$ and $CD4^+$ lymphocytes were raised in the combined LBCB group at 7 dpi ($P < 0.05$); IgA^+ lymphocytes increased earlier at 4 dpi ($P < 0.01$) in this group. Caecal LPLs showed the highest values of IgA^+ at 4 dpi ($P < 0.05$) and 7 dpi together with IgM^+ cells in the LBCB and LB groups. The concentration of sIgA was increased in the LB and LBCB groups compared with controls ($P < 0.001$) at 7 dpi. The concentration of MUC1 was not changed. Decreased concentration of MUC2 was observed in experimental groups compared with control group at 7 dpi ($P < 0.001$).

Discussion: The results suggest a beneficial effect of *L. fermentum* on improving intestinal immunity against *Campylobacter* spp.

ANTE-MORTEM DIAGNOSIS OF BOID INCLUSION BODY DISEASE: A ROLE FOR SEROLOGY?

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Introduction: Boid inclusion body disease (BIBD) is a globally distributed, potentially fatal disease of captive boid snakes causatively linked to reptarenavirus infection. The present study assessed the adaptive immune response of Boas towards reptarenaviruses and serology as a diagnostic tool.

Materials and Methods: Blood samples from 70 adult *Boa constrictor* snakes from one breeding colony were investigated for BIBD (presence of intracytoplasmic inclusion bodies in blood cells by cytology) and reptarenavirus viraemia (NGS and S-segment-specific RT-PCRs). They were also tested for anti-reptarenavirus IgM and IgY antibodies by western blot and ELISA. Statistical analyses were performed and the results examined against measurable population parameters.

Results: BIBD was found to be associated with a significantly lower body weight in female snakes and to have substantial agreement with the presence of University of Giessen virus (UGV)-like S segment RNA in the blood. We also observed a negative association between BIBD and the presence of IgY antibodies specific for the UGV nucleoprotein (anti-UGV NP IgY).

Discussion: The strong association between the detection of UGV S segment and BIBD suggests that the encoded proteins are essential for inclusion body formation (and thereby BIBD) within this breeding colony. The negative association between BIBD and anti-UGV NP IgY antibodies provides evidence that the disease does cause immunosuppression. Our results suggest that presence/absence of UGV S segment RNA and/or anti-UGV NP IgY antibodies could partially assist in the ante-mortem diagnostics of BIBD; however, serology per se cannot replace the demonstration of inclusion bodies as the current diagnostic standard.

INFECTIOUS BRONCHITIS VIRUS QX FIELD PROGENITOR LOSES NEPHROPATHOGENICITY AFTER ATTENUATION INTO A LIVE VIRAL VACCINE

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Introduction: Infectious bronchitis (IB) is a gammacoronavirus-induced respiratory disease in chickens. IB virus strain QX is additionally known for its detrimental nephropathogenicity. In this study we compared the phenotypic differences between an IB QX vaccine virus and its field progenitor with focus on viral replication and dissemination through the host.

Materials and Methods: Specific pathogen free chickens were inoculated intratracheally with either 10^3 EID_{50} vaccine strain Nobilis IB Primo QX (MSD Animal Health) or field strain IBV-D388 and killed at 1 day intervals over an 8-day period. Histopathology was studied over time in the trachea, kidney, cloaca and gastrointestinal tract. Immunohistochemistry was used to demonstrate viral protein expression in these tissues. qPCR was performed on tracheal and cloacal swabs and kidney to reveal viral RNA loads.

Results: IB Primo QX and IBV-D388 induced comparable tracheal lesions, characterized by epithelial cell death and desquamation and heterophilic and lymphohistiocytic infiltration. Changes were earlier and more severe with IBV-D388, while tracheal viral RNA loads were comparable over time for both viruses. In contrast, degenerative and inflammatory lesions and viral protein and RNA were only found after IBV-D388 infection in the kidneys. This renal viral presence was preceded by viral RNA detection in the cloaca and viral protein expression in the gastrointestinal tract, albeit without associated lesions in these tissues.

Discussion: Dissemination to the kidneys by IBV-D388 might result from cloacal ascending infection. In contrast to its field progenitor, IB Primo QX was unable to cause renal infection, which likely considerably contributes to attenuation of its phenotype.

BORNA DISEASE VIRUS 1 INFECTION IN ALPACAS (*LAMA PACOS*) – DISTRIBUTION OF VIRAL ANTIGEN AND INFLAMMATORY LESIONS

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Introduction: Horses, sheep and people can act as accidental dead-end hosts of Borna disease virus 1 (BoDV-1). Over a period of 4 months, four female and six male alpacas (*Lama pacos*) from the same herd in the state of Brandenburg, Germany, had shown neurological disorders or suffered sudden death and nine of these animals died. This report describes the distribution of inflammatory lesions and BoDV-1 in the accidental host alpaca.

Materials and Methods: Four male alpacas were systematically analysed to determine the distribution of inflammatory infiltrations. RT-qPCR and immunohistochemistry with antibodies specific for bornavirus nucleoprotein and phosphoprotein were used to detect BoDV-1 in different tissues including central and peripheral nervous tissues, intestine, liver and kidney.

Results: A perivascular, lymphocytic meningoencephalomyelitis with few neutrophils was the predominant lesion, as described before. In addition, severe lymphocytic hypophysitis of the pars intermedia was diagnosed. BoDV-1 was detected in tissues of the central nervous system and in the optic nerve and retina of all animals analysed. Additionally, the facial nerve, sciatic nerve and nasal mucosa of one animal was positive for BoDV-1.

Discussion: In addition to the central nervous system, the pars intermedia of the pituitary gland and peripheral nerves are important targets of BoDV-1 in alpacas. Furthermore, the northwestern parts of Brandenburg seem to be a previously uncharted endemic area of Borna disease in Germany.