Contribution ID: **184** Type: **Oral presentation**

Neutralization of the hepatitis E virus by porcine serum antibodies in a cell-culture based assay

Monday, 9 October 2023 16:15 (15 minutes)

Wild boars and domestic pigs are the main reservoir hosts for the hepatitis E virus (HEV). Therefore, consumption of raw meat and other animal products pose a serious risk for human HEV infections. So far, the HEV prevalence in domestic pig and wild boar has been determined by RT-PCR and antibody ELISA. To characterize neutralizing properties of porcine anti-HEV serum antibodies, a neutralization assay was established using the human hepatoma cell line PLC/PRF/5, and the human genotype 3 HEV strain 47832c. Before application in the assay, it was imperative to treat the virus with bile acid to remove the quasi-envelope of the viral particles enabling binding of antibodies to the virus particle surface. After incubation of the virus with dilution series of the sera, the mixtures were added to the cells and the infection rate was evaluated one week later by immunofluorescence staining to calculate the neutralizing titer (ND50).
The antibody status of 343 wild boar sera collected in Lower Saxony, Germany, was determined by an in-house ELISA with a detection rate of 19 % anti-HEV IgG positive samples. A subset of 41 HEV RNA-negative and lowly to highly ELISA-reactive serum samples were investigated in parallel in the neutralization test. It could be shown that the ND50 correlates well with the corresponding s/p-ratio in ELISA. Neutralizing capacities of additional sera, which were positive for both, anti-HEV antibodies and HEV RNA, were also proven in the newly established assay.

Keywords

hepatitis E virus, porcine antibodies, virus neutralization, assay development

Registration-ID code

ZOO23-463

Professional Status of the Speaker

Postdoc

Junior Scientist Status

Yes, I am a Junior Scientist.

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Session Classification: Session 2: Vaccines & Immunology

Track Classification: Vaccines & Immunology