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Pathogenesis of West Nile virus lineage 2 in domestic geese after experimental infection

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West Nile virus (WNV) is an emerging infectious zoonotic pathogen circulating between mosquitoes and birds with mammals as dead-end hosts. Since its first detection in Germany in 2018, WNV has become autochthonous, causing high mortality rates in avian species and occasional diseases in humans and horses.

To determine the possible role of free-ranging geese as amplifying hosts, 15 three-week-old domestic geese were infected subcutaneously with WNV lineage 2, an isolate from Germany from 2018 (acc. no. MH924836). The geese were sampled regularly, euthanized at various time points up to 21 days post infection (dpi), and a gross examination was performed. Subsequently, a detailed virological and histopathological / immunohistochemical examination was done. By real-time quantitative polymerase chain reaction and virus titration, virus was detected in all of the examined organs at early time points. Also, by immunohistochemistry, viral antigen was found in the brain and in the enteric nervous system of several geese as well as nonsuppurative encephalitis and ganglioneuritis.

This study provides interesting information on the organ distribution and pathohistological lesions of WNV during the course of infection in geese. The more detailed immunopathogenesis of WNV (e.g. in the brain) requires further research.