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GOOSE VIRUS HEPATITIS IN THE CANADA GOOSE AND SNOW GOOSE

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Abstract: Seven Canada Goose goslings and one Snow Goose gosling died suddenly and were presented for diagnosis. Gross and microscopic lesions of hepatitis were observed in all birds. A virus was isolated in embryonated goose eggs which, on the basis of complement fixation and immunofluorescence tests, was identified as goose hepatitis virus. The epornitioiology of this virus is discussed.

INTRODUCTION

Goose hepatitis is a highly infectious disease affecting goslings under four weeks of age. It has been observed in domesticated goslings in Germany for many years. The etiological agent is a small DNA virus probably of the parvovirus group serologically unrelated to other known avian viruses including duck plague, duck hepatitis, a previous isolate from goslings in Germany and isolates from Hungary. This paper reports an accidental infection of the Canada Goose (Branta canadensis canadensis) and Snow Goose (Chen hyperborea atlantica) with goose hepatitis virus (GHV) which is thought to have originated from the laboratory.

At post mortem examination the most prominent visceral lesions were a greatly swollen, copper colored liver with small petechial hemorrhages and fibrinous exudate on the surface, an enlarged gall bladder filled with bile, dilatation of the heart, and ascites. Specimens of liver and pancreas were taken separately from the two wild goose species for histological, bacteriological and virological examination. Smears of the liver and pancreas were prepared on micro-slides for an immuno-fluorescence test which we have developed. A tentative diagnosis of goose hepatitis was made.

Virus isolation was attempted in 14 day embryonated goose eggs, since studies have shown that GHV will propagate in them. A tissue suspension (10% w/v) of the liver and pancreas of the dead goslings was prepared by homogenizing them in buffered saline containing 10000 IU penicillin and 60 mg streptomycin/ml. A portion, 0.3 ml, was inoculated into the allantoic cavity of each of five embryos. The embryos died 6 days later with signs of GHV infection. The skin was reddened. There was edema of the subcutis, distension of the abdomen and irregular necrotic areas in the liver.

Virus identification was confirmed as follows:

a) A standard complement fixation test was performed using hyperimmune pigeon anti-GHV serum and the allantoic fluid of the inoculated eggs as antigen.
b) Smears from the liver, brain and chorioallantoic membrane (CAM) were stained in a direct immunofluorescence test using fluorescein-conjugated goose anti-GHV serum.

RESULTS

There was a strong specific fixation in the complement fixation test. In the immunofluorescence test, both with specimens from the dead gosling and goose embryos, there was a specific reaction consisting of a granular nuclear stain. Unusually strong reactions were observed in smears from the pancreas. Thus, according to these tests, the agent isolated from the gosling was identified as GHV.

DISCUSSION

The mortality in the young Canada Goose and Snow Goose goslings was the result of an infection by GHV, as indicated by isolation and serological studies. Prior to this outbreak, goose hepatitis was unknown in the zoo. Since the incubation period is three to six days, the probable source of GHV was the poultry disease laboratory in which work with GHV was being performed at the time. Humans might have been the vectors since goose hepatitis is highly contagious among domestic geese.2,3

Clinical disease was successfully prevented in later hatches by the subcutaneous inoculation of 1.0 ml hyperimmune goose anti-GHV serum on the day of hatching.

This report indicates that these two species of wild geese are highly susceptible to GHV. There are similarities in the clinical and pathological responses to the infection between these wild species and the domestic goose. In this respect, it is interesting that the Canada Goose does not belong to the genus Anser as does the Snow Goose. The increasing incidence of goose hepatitis in Germany and the growing number of captive Canada Geese in city parks greatly increase the risk to migratory geese. Thus the disease could be enzootic in captive wild geese which could act as reservoirs of the virus. There is a great danger that the infection will be transmitted to the wild goose population at any time. The possible disastrous consequences for goslings in the densely populated breeding grounds should be considered even though no such outbreaks in wild geese have been reported.

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LITERATURE CITED


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