EXPERIMENTAL STUDY OF CONTAGIOUS PARALYSIS OF PIGEONS

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SUMMARY

A study of the clinical and pathological changes in pigeons experimentally inoculated with a herpesvirus isolated recently from natural cases of a condition termed contagious paralysis was carried out. Signs and pathological findings similar to those recorded in natural cases were produced after inoculation of the isolate via different routes.

The incubation period differed according to the route of inoculation from 2 to 10 days and the course of the disease from 5 to 21 days. The mortality ranged from 100% in the intracerebrally inoculated pigeons to 61% in the orally infected ones.

The clinical signs and the gross and histopathological changes included mainly progressive paralysis, meningo-encephalomyelitis, pancreatitis and sometimes enteritis.

INTRODUCTION

In 1978 Mohammed, Sokkar and Tantawi reported for the first time a disease occurring in pigeons characterised by nervous signs and marked contagiousness and they isolated a virus belonging to the herpesvirus group which they presumed to be causally related to the disease.

The present work was designed to study the clinico-pathological findings in groups of pigeons inoculated with that isolate via different routes to throw more light on the pathogenesis of this disease. Also the pathogenicity of the isolate was tested in chicks.

MATERIALS AND METHODS

Pigeons 3 to 6 months old from different sources were used in this experiment. They were kept in previously sterilised metal boxes and were left under observation for 17 days before infection. Feed consisted of commercial broiler mash and water was supplied directly from the tap. Infection occurred via the digestive, intravenous, intratracheal and intracerebral routes. Each group consisted of 18 pigeons and the dose of infection for each pigeon was $10^{-9} \text{TCD}_{50}/0.1 \text{ ml}$.

The birds were then observed for the onset of clinical signs. Dead birds as well as severely moribund ones after being killed were examined exhaustively for pathological lesions. Samples from the brain, spinal cord, sciatic and brachial plexi, pancreas, duodenal loop, liver, spleen and lungs were fixed in 10% formal saline for histopathological examination. A group of 12 completely isolated 5-day-old chickens was inoculated with the same dose in the skeletal muscles of the thigh. The chicks were observed for 15 days after inoculation for any clinical signs and on the day 16 they were killed and examined for gross and microscopic lesions.

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RESULTS

Clinical signs

Two birds from the intravenously inoculated group and one from the intracerebrally infected group died within 48 h after infection after showing general depression. The intracerebrally inoculated pigeons showed signs 2 days after infection. The signs started with rapidly progressing depression, abnormal gait and tremors in the head and neck. Nervous symptoms differed and involved either the head and neck area and/or one or more extremities. They included tremors and partial or complete twisting of the head and neck. Later complete twisting of the neck led to laying the head on the ground. Circling movements were less common while affection of the extremities was the commonest observation. Paresis of one or sometimes both legs or wings was seen followed rapidly by complete paralysis of the affected extremity, the legs being more commonly affected than the wings. Diarrhoea was seen in the pigeons inoculated per os. Neither the control pigeons nor the chicks showed signs of illness.

Gross pathology

Pigeons which died within 48 h after inoculation showed no gross lesions except congestion of the brain and the surrounding meninges of those inoculated intracerebrally and general congestion in the case of intravenously inoculated pigeons. Later congestion of the brain and meninges was constantly seen. The pancreas was always enlarged with patchy or diffuse congestion and not uncommonly only greyish white foci were seen. In some pigeons the pancreas showed petechial haemorrhages which were sometimes diffuse. The intestines, specially the duodenum and to a lesser extent the jejunum parts were seen especially in the orally inoculated pigeons, to show congestion of the mucosal surface giving a velvet-like appearance. The liver was congested in the pigeons which died a few days after infection and in a few cases it appeared degenerated and of yellowish discolouration. The spinal cord, peripheral nerves, spleen and lungs showed no pathological changes.

Histopathology

Nothing was seen in the brains of pigeons which died before showing nervous signs apart from congestion of the capillaries and small blood vessels. In more advanced cases a lymphocytic meningo-encephalitis was seen, while in the late stages eosinophilic rounded intranuclear inclusion bodies were seen in some neurons.

Lesions in the spinal cord were seen only in pigeons showing paralytic signs, when they took the form of aggregations of mononuclear cells in the grey matter. There was acute pancreatitis with engorged blood vessels and prominent lymphocytic infiltration. Sometimes areas of haemorrhages were seen.

There was acute coagulative necrosis in the intestines involving especially the tips of the mucosal villi and extending to some extent downwards. The necrosed parts appeared more eosinophilic with nuclear fragments. Moderate lymphocytic infiltration in the deeper parts of the mucosa was also seen. These lesions were seen mainly in the pigeons inoculated via the digestive route.

Minute necrotic areas were present here and there in the liver specially near the central vein. Some hepatocytes appeared degenerated with enlarged nuclei. The latter contained eosinophilic inclusion bodies. Focal areas of lymphocytic aggregations were constantly seen. No lesions were seen in the nerves, lungs or spleen. Chicks showed no microscopic changes.