Experimental Infections of Feline Reovirus Serotype 2 Isolates

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ABSTRACT. Pathogenicity of feline reovirus serotype 2 isolates, Nos. 114 and 140 strains recovered from the feces of cats with diarrhea, was experimentally determined. Kittens orally inoculated with No. 114 strain did not show any clinical signs. Fecal consistency of kittens inoculated with No. 140 strain became rather diarrheic on the 3rd and 4th days after inoculation, but any other clinical abnormalities were not observed. Virus was excreted for the first five to six days after inoculation. Seroconversion was observed in the sera of all the inoculated kittens. Virus excretion and seroconversion were also noted in all contact control kittens. These results may indicate that feline reovirus serotype 2 is mildly pathogenic in cats.—**KEY WORDS:** diarrhea, feline, serotype 2 reovirus.

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Reovirus has been generally recognized as an upper respiratory pathogen of cats, although the disease-causing potential of reovirus in this species has not been fully investigated [4]. During the course of etiological survey of diarrhea in cats, three reovirus strains possessing serotype 2 specificities and showing trypsin-dependent growth *in vitro* were detected, and a possibility that serotype 2 reoviruses may cause enteric-infections causing diarrhea in cats has emerged [1]. Recently, Muir *et al.* [2, 3] also reported a possible association of serotype 2 reovirus with feline enteric diseases. In the present communication, the results of experimental infections of kittens with our feline serotype 2 reovirus strains are described.

Experiment 1: This experiment was conducted using No. 140 strain which was an atypical serotype 2 reovirus considered to have been epizootically maintained in the cat population [1]. Two litters of four (68-days old) and two (70-days old) kittens were divided into two groups. The infected group consisted of three kittens from the first litter and one from the latter while the remaining two kittens composed the contact control group. All kittens were sero-negative (serum titer: <1:4) against the strain by hemagglutination (HA)-inhibition (HI) assay described previously [1]. Each kitten received 5 ml of culture fluid containing 6,400 HA units and was observed for two weeks. The kittens of each group were housed together in a cage but contact between two groups was allowed for about 15 min during daily cage-cleaning.

Fecal consistency of the inoculated kittens became from normal to soft or rather diarrheic on the 3rd and 4th day, but they retained normal appetite, gained weight, and did not show any other clinical signs such as upper respiratory tract infection throughout the observation period. Virus was excreted continuously in the feces for the first six days after inoculation. They were seroconverted with HI antibody titers elevated to 1:64–256 when examined on the 14th day.

The contact control kittens also remained normal throughout the period with an unexpected clinical episode: fecal consistency of one cat became diarrheic only on the 7th day and virus was recovered from the feces. Virus excretion from both control kittens was not monitored daily, hence, no data regarding this was obtained. However, their serum antibody titers also converted to

1:64 and 1:128, respectively.

Experiment 2: This experiment was conducted using No. 114 strain which was a typical mammalian serotype 2 reovirus of feline origin [1]. A litter of four kittens, about 90-days old and sero-negative, were used in this experiment: three kittens for infection and one for control. Each kitten received 5 ml of culture fluid containing 102,400 HA units and was observed for two weeks as in Experiment 1.

The inoculated kittens retained normal appetite, gained weight well, and showed no clinical signs throughout the observation period. Virus was excreted continuously in feces for the first five days and on the 7th day after inoculation. They were seroconverted and their HI antibody titers were 1:64 to 1:256 on the 14th day.

While the contact control kitten also appeared to be normal throughout the period, it became infected also with No. 114 strain by contact with its littermates because virus was excreted in its feces for seven days between the 2nd and 8th day of the experiment period and HI antibody (1:64) was detected in its serum after the period.

It may be pointed out from the data obtained by the present experiments that: 1) these serotype 2 reoviruses do not cause devastating diarrheic disease in cats, and 2) they are readily transmissible presumably by contact with infected animals. Furthermore, there may exist some difference in virulence between the strains used here. It is likely that strain No. 140 is more virulent than strain No. 114 with respect to its diarrhea-causing potential, and this may be attributable, if anything, to the subtle difference observed in their growth ability *in vitro* [1]. Although No. 114 strain grows better in a medium containing trypsin, the trypsin-dependency of No. 140 strain is more remarkable and may be rather essential for its growth. A probable relevant implication of this finding is that No. 140 strain can grow more efficiently and hence, is more virulent in the gut where proteolytic enzymes exist.

Taken together with the observation that mild clinical signs of diarrhea were noted in kittens infected with a feline reovirus serotype 2 isolate described by Muir *et al.* [2], it is tentatively concluded that feline reovirus serotype 2 may be involved in the diarrhea-causing virus complex (parvovirus, rotavirus, coronavirus, astrovirus, and possibly calicivirus) in this species, though it is obviously not so

pathogenic and clinically not so important as parvovirus. Since all of three reoviruses isolated from 148 fecal samples was serotype 2 [1], we have not determined pathogenicities of other serotypes for alimentary tract of cats. Further investigations to know the diarrhea-causing potential of feline serotypes 1 and 3 reoviruses and general clinical effects of more feline isolates are needed because only a limited report describing experimental feline reovirus serotype 3 infection is available [5].

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