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CORONAVIRUS DISEASE 2019 UPDATE (183): JAPAN/USA, ANIMAL, RESEARCH, CAT, EXPERIMENTAL INFECTION
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A ProMED-mail post
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International Society for Infectious Diseases
http://www.isid.org

Date: Wed 13 May 2020
Source: The New England Journal of Medicine [edited]
https://www.nejm.org/doi/full/10.1056/NEJMc2013400?query=TOC

Citation: Halfmann P, Hatta M, Chiba S, Maemura T, et al. Transmission of SARS-CoV-2 in Domestic Cats. New England Journal of Medicine (Correspondence). 13 May 2020. DOI: 10.1056/NEJMc2013400.

To the editor:

Reports of human-to-feline transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and of limited airborne transmission among cats prompted us to evaluate nasal shedding of SARS-CoV-2 from inoculated cats and the subsequent transmission of the virus by direct contact between virus-inoculated cats and cats with no previous infection with the virus. Three domestic cats were inoculated with SARS-CoV-2 on day 0. One day after inoculation, a cat with no previous SARS-CoV-2 infection was cohoused with each of the inoculated cats to assess whether transmission of the virus by direct contact would occur between the cats in each of the 3 pairs. Nasal and rectal swab specimens were obtained daily and immediately assessed for infectious virus on VeroE6/TMPRSS2 cells.

On day 1, we detected virus from 2 of the inoculated cats. By day 3, virus was detectable in all 3 inoculated cats, with continued detection of virus until day 5 in all cats and until day 6 in 2 of the 3 cats.

The cats with no previous infection were cohoused with the inoculated cats on day 1. Two days later (day 3), one of the cats with no previous infection had infectious virus detected in a nasal swab specimen, and 5 days later, virus was detected in all 3 cats that were cohoused with the inoculated cats. Virus titers in the cats that were cohoused with the inoculated cats peaked at 4.5 log10 plaque-forming units per milliliter, and virus shedding lasted 4-5 days. No virus was detected in any of the rectal swabs tested. Although there have been reports of symptomatic infected cats, none of the cats in our study showed any symptoms, including abnormal body temperature, substantial weight loss, or conjunctivitis. All the animals had IgG antibody titers between 1:5120 and 1:20 480 on day 24 after the initial inoculation.

With reports of transmission of SARS-CoV-2 from humans to domestic cats and to tigers and lions at the Bronx Zoo, coupled with our data showing the ease of transmission between domestic cats, there is a public health need to recognize and further investigate the

potential chain of human-cat-human transmission. This is of particular importance given the potential for SARS-CoV-2 transmission between family members in households with cats while living under "shelter-in-place" orders. In 2016, an H7N2 influenza outbreak in New York City cat shelters highlighted the public health implications of cat-to-human transmission to workers in animal shelters. Moreover, cats may be a silent intermediate host of SARS-CoV-2, because infected cats may not show any appreciable symptoms that might be recognized by their owners. The Centers for Disease Control and Prevention has issued guidelines for pet owners regarding SARS-CoV-2 (https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/animals.html) [see comment]. Given the need to stop the coronavirus disease 2019 pandemic through various mechanisms, including breaking transmission chains, a better understanding of the role cats may play in the transmission of SARS-CoV-2 to humans is needed.

[For the omitted tables, figures, and references, please refer to the full text of this letter at the source URL.]

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The link to the (US) CDC guidelines, included in the above letter, leads to "Interim Guidance for Public Health Professionals Managing People With COVID-19 in Home Care and Isolation Who Have Pets or Other Animals" at https://www.cdc.gov/coronavirus/2019-ncov/php/interim-guidance-managing-people-in-home-care-and-isolation-who-have-pets.html.

Guidelines have also been published by veterinary authorities/institutions in other countries, such as the German version, published by FLI at https://www.openagrar.de/servlets/MCRFileNodeServlet/openagrar_derivate_00029177/Empfehlung-Umgang-mit-empfaenglichen-Haustieren_23-04-2020.pdf.

A serosurvey in China revealed 10-15% positive cats in Wuhan (20200403.7179946). Researchers from the universities of Padua and Venice undertook a serosurvey for SARS-CoV-2 covering the domestic cat population of the town Vo (20200422.7256272). A similar survey has been initiated by the Utrecht university. According to a media report dated 7 Apr 2020, "scientists at the Free University of Berlin are carrying out PCR tests similar to those on humans to detect whether COVID-19 has spread to pets. One virologist said cats appeared to be more vulnerable than dogs and could become 'carriers.' However, there have been no reported cases of humans being infected by their pets" (https://tinyurl.com/yar94psp).

In view of the growing evidence of SARS-CoV-2 infections in domestic cats, the possible cat-to-cat infection as demonstrated in the above (small-scale) experimental infection trial and by the earlier Harbin trial (20200402.7173286), and while anticipating results of the various serosurveys in cat populations, the following ProMED-mail comment, published in 20200501.7289409, is duplicated: Stray cats should be kept away, as far as possible, from the premises of sheltered facilities for the elderly to protect the health of the inhabitants and their owned pets. - Mod.AS]

See Also

COVID-19 update (181): Germany (BY), France (AC), cat, OIE animal case definition 20200513.7332909
COVID-19 update (174): Netherlands (NB) animal, farmed mink, comment 20200511.7323845
COVID-19 update (169): Netherlands (NB) animal, farmed mink, spread, rabbit susp 20200509.7316646
COVID-19 update (154): Netherlands (NB) animal, farmed mink, research 20200503.7294846
COVID-19 update (146): Netherlands (NB) animal, farmed mink, epidemiology 20200501.7286113
COVID-19 update (135): Netherlands (NB) animal, farmed mink 20200427.7272289
COVID-19 update (146): Netherlands (NB) animal, farmed mink, epidemiology 20200501.7286113
COVID-19 update (143): USA (NY) animal, zoo, tiger, lion, tests 20200430.7284183
COVID-19 update (141): India, animal, wild tiger, susp, clarification, RFI 20200430.7281768

COVID-19 update (138): India, animal, wild tiger, fatal 20200428.7275765
COVID-19 update (135): Netherlands (NB) animal, farmed mink 20200427.7272289
COVID-19 update (130): USA (NY) animal, zoo, tiger, lion, new cases 20200425.7266556
COVID-19 update (124): USA (NY) animal, cat, lion, OIE 20200423.7259119
COVID-19 update (123): USA (NY) animal, cat, conf 20200422.7256272
COVID-19 update (113): USA (NY) cat, animal, susp, RFI 20200418.7240811
COVID-19 update (88): Germany, animal, research, pig, chicken, bat, ferret 20200407.7196506
COVID-19 update (85): USA (NY) animal, tiger, OIE 20200406.7191480
COVID-19 update (84): USA animal, tiger 20200406.7191352
COVID-19 update (76): China (HU) animal, cat, owned, stray, seropositive 20200403.7179946
COVID-19 update (75): China (Hong Kong) animal, cat, OIE 20200403.7179945
COVID-19 update (70): China (Hong Kong) animal, cat, pets & stock 20200402.7173286
COVID-19 update (58): Belgium, animal, cat, clinical case, RFI 20200327.7151215
COVID-19 update (56): China (Hong Kong) animal, dog, final serology positive 20200326.7146438
COVID-19 update (50): China (Hong Kong) animal, dog, 2nd case PCR positive, OIE 20200323.7129951
COVID-19 update (45): China (Hong Kong) animal, dog, 2nd case PCR positive 20200319.7112693
COVID-19 update (37): China (Hong Kong) animal, dog, prelim. serology negative 20200312.7081842
COVID-19 update (30): China (Hong Kong) animal, dog, susp, serology pending 20200306.7057595
COVID-19 update (25): China (Hong Kong) animal, dog, susp, OIE 20200302.7040373
COVID-19 update (22): companion animal, dog susp, RFI 20200229.7036661
COVID-19 update (17): China, animal reservoir, wildlife trade & consumption 20200225.7024245
COVID-19 update (11): animal reservoir, intermediate hosts, pangolin susp 20200220.7009213
COVID-19 update (08): companion animal, RFI 20200218.7002276
COVID-19 update (06): animal reservoir, intermediate hosts 20200217.6997782
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