Is Human Norovirus Zoonotic from Dogs?

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Di Martino B, Di Profio F, Melegari I, et al. Seroprevalence for norovirus genogroup II, IV and VI in dogs. *Vet Microbiol.* 2017;203:68-72.

FROM THE PAGE …

Noroviruses, which are in the Caliciviridae family, are a common cause of acute gastroenteritis in humans.[1] Concerns have been raised regarding the possibility of transmission of noroviruses between humans and pet dogs.

This study evaluated serum samples from household dogs presented to veterinary clinics in Italy from March 2013 to July 2015. The dogs' history, health, and exposure to ill humans were not reported. Samples were tested using an ELISA to detect antibodies to 2 human noroviruses (GII.4 and GIV.1) and 2 carnivore noroviruses (GIV.2 and GVI.2).

Of 516 samples, 10.1% were positive for human norovirus GII.4 and 3.9% for human norovirus GIV.1, at mostly lower dilutions; 3.9% were positive for carnivore norovirus GIV.2 and 8.9% for carnivore norovirus GVI.2. A strong correlation was found between titers to GII.4 and GVI.2, leading the authors to conclude there is cross-reactivity between these human and carnivore noroviruses, which may be from conserved epitopes in the major capsid protein VP1.

This study documented that Italian dogs have been exposed to carnivore and human noroviruses and have mounted an immune response. Presence of an antibody titer does not imply these dogs had clinical illness or shed virus. To help determine canine and zoonotic risk, the ability of norovirus to bind and replicate in canine intestines as well as fecal shedding of virus in sufficient amounts to cause human illness need to be documented. Human noroviruses can bind to canine GI tissue in vitro, but this has not been documented in vivo or from clinical cases.[2]

Human norovirus (GII.4, GII.12) has been isolated via PCR from the feces of 4 of 92 dogs exposed to humans with GI illness; of these 4 dogs, 2 had mild GI signs.[3] However, fecal PCR failed to find human norovirus in stool samples from 248 dogs (117 healthy, 131 with GI illness).[2] Thus far, these studies suggested theoretical-to-minimal risk for clinical illness in dogs from human norovirus and similar theoretical risk for zoonotic transmission.

References

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2. Caddy SL, de Rougemont A, Emmott E, et al. Evidence for human norovirus infection of dogs in the United Kingdom. *J Clin Microbiol*. 2015;53(6):1873-1883.
3. Summa M, von Bonsdorff CH, Maunula L. Pet dogs—a transmission route for human noroviruses? *J Clin Virol*. 2012;53(3):244-247.

… TO YOUR PATIENTS

Key pearls to put into practice:

1. Additional research is needed to determine the clinical relevance of these findings and to make optimal public health recommendations for pet owners.
2. A One Health approach is valuable. Clinicians should consider the health of all household members, as some infectious agents can be shared across species.
3. Common hygiene practices (eg, hand washing) should be encouraged whenever a household pet or person is ill.

Please see brief summary on page 42.