

Capsules

The Current Literature in Brief



Pets: Reservoirs of *E coli*?

Shiga toxin–producing *Escherichia coli* (STEC) is a food-borne pathogen that can cause diarrhea, sometimes complicated by hemolytic-uremic syndrome (HUS). Cattle and other ruminants are the major reservoirs. STEC produces two potent cytotoxins (Stx1, Stx2) that inhibit protein synthesis. In humans, another virulence factor is the outer membrane protein intimin, encoded by the *eae* gene.

In this study, 9 STEC strains isolated from dogs and cats were tested for a range of virulence factors, genetic relationships with strains from cattle, and cytotoxic activity. All 9 strains showed cytotoxic activity. None of the strains possessed the genes *subAB*, *eae*, or *saa*, which encode for virulence factors. Only strains belonging to the subtype O8:H19 carried the *exhA* gene, which encodes for the virulence factor enterohemolysin. The 9 isolates were 90% to 100% similar to serotypes recovered from cattle, meat, and humans; several STEC strains belonged to pathotypes associated with human disease, including HUS. The virulence patterns suggested the source may be from bovine meat fed to pets by their owners. Pets may have an epidemiologic role as a source of STEC infections in humans.

Commentary

Outbreaks of STEC are commonly a result of *E coli* 0157; however, other strains of STEC serogroups also can cause severe illness in humans of all ages. A severe complication of STEC illness that occurs in 5% to 10% of infected humans is HUS. This study revealed that companion dogs and cats can harbor serogroups of STEC that are 90% to 100% genetically similar to strains of corresponding serotypes recovered from cattle, meat, or humans. Although only 9 isolates were examined, the genetic similarity to previous outbreak strains and the presence of putative virulence factors in these strains highlighted that pets could potentially be silent reservoirs of STEC.—*Faye Hartman, MS, MT (ASCP)*

Source

Profile of Shiga toxin-producing *Escherichia coli* strains isolated from dogs and cats and genetic relationships with isolates from cattle, meat and humans. Bentancor A, Rumi MV, Carbonari C, et al. *VETMICROBIOL* 156:336-342, 2012.

Continues

Targeting Idiopathic Epilepsy in Dogs

Epilepsy is classified as idiopathic (genetic) or symptomatic (structural/metabolic), and seizures are classified as focal or generalized. This study identified the genetic cause of idiopathic epilepsy in Belgian shepherds. Samples were collected from 159 dogs and 148 controls in Finland, Denmark, and the United States; owners of the Finnish cohort also filled out questionnaires. Seizures began at 3 months of age up to 9 years (mean, 3.3 years). The median frequency of seizures was 5.25/year, with some dogs having fewer than 1/year and others having up to 10/day. Gene mapping was done for 40 cases and 44 controls. Homozygosity for a 2-SNP haplotype within the *ADAM23* gene conferred the highest risk for epilepsy. A resequencing study to target the causative mutation has been initiated; this could establish the affected breed as a therapeutic model for human idiopathic epilepsy.

Source

Identification of a novel idiopathic epilepsy locus in Belgian shepherd dogs. Seppälä EH, Koskinen LLE, Gulløv CH, et al. **PLoS ONE** doi:10.1371/journal.pone.0033549, 2012.

Bird Flu Still at Large

Avian influenza virus remains a potential threat to humans. The H5N1 virus was first isolated in 1996 from a goose in China; in 1997, outbreaks on poultry farms and live animal markets in Hong Kong were reported, along with human infections. New variants of H5N1 emerged in 2001 and 2003. From 2003 to March 2010, the World Health Organization reported 289 deaths for the 488 confirmed human cases of H5N1 infection. In early cases, almost all patients presented with fever, cough, shortness of breath, and lower respiratory tract symptoms. More rapid progression of disease and more fatalities were observed in later cases, and GI and encephalitic symptoms predominated. After a 2004 outbreak, H5N1 was documented in several naturally infected species.

This study used a ferret model to evaluate neurologic disease in H5N1 infection and evaluated treatment with the antiviral agent peramivir, a neuraminidase inhibitor. Viral replication activity was very high in ferret brain tissue, with viral antigens found predominantly in neurons, correlating with inflammatory lesions. Early and continuous treatment with peramivir inhibited virus production to nondetectable levels, reduced severity of brain injury, and promoted higher survival rates.

Source

Neuropathology of H5N1 virus infection in ferrets. Peng B-H, Yun N, Chumakova O, et al. **VET MICROBIOL** 156:294-304, 2012.

Impact of Clean Suction Cups

Suction tip contamination is reportedly as high as 70% in human orthopedic surgical procedures. Changing the suction tip during total hip replacement has been shown to decrease contamination rates from 36% to 3.2%. Duration of surgery appeared to be a contributing factor. Veterinary surgical procedures have a documented suction tip contamination rate of 68% for clean, clean-contaminated, and contaminated surgical procedures. This study investigated contamination rates of suction tips in 50 clean orthopedic surgical procedures in dogs and cats, compared the

contamination rates between intermittent and continuous suction, evaluated the effect of time on contamination rate, and reported the isolated bacterial species.

Results showed that contamination of suction tips during veterinary surgery was relatively common (44%). Coagulase-negative *Staphylococcus* spp were most frequently isolated. This rate was similar to that reported for human surgery but lower than that previously reported. High rates suggested that airborne contamination of a suction tip was highly likely during surgery, warranting attention to sterility. Limiting surgical time and changing suction tips every 60 minutes were advised.

Commentary

Similar to human studies, these results suggested the importance of airborne and other environmental sources of bacteria in surgical site infections. Although the authors were unable to make any definitive conclusions, they did well in designing and conducting this study. Perhaps a similar study with a larger number of patients would add some statistical validity to the results presented here.—*Arthur A. Fettig, DVM, DACVS*

Source

Intraoperative contamination of the suction tip in clean orthopedic surgeries in dogs and cats. Medl N, Guerrero TG, Hölzle L, et al. **VET SURG** 41:254-260, 2012.

Puppy Love: Pets as Social Support

Three studies have demanded evidence that pets can benefit owners both psychologically and physically by serving as an important source of social support. The first study looked at well-being differences between pet owners and nonowners in a large community. Pet owners were found to do better in several well-being measures (eg, self-esteem, exercise/fitness level, loneliness) and individual-difference measures (eg, more conscientious, more extroverted, less fearful, less preoccupied). The second study evaluated dog owners' social needs fulfillment from people and their dogs. Individual pet personality was also evaluated (animalpersonalityinstitute.net). The study found that the well-being benefits of pet owners were more pronounced when dogs filled social needs more effectively, and that the support provided by pets complements human sources. In the third study, the ability of pets to stave off negativity caused by social rejection was experimentally demonstrated.

Commentary

Strike another chord for One Health Initiative. Fido and Kitty are as important to owners as are siblings and parents. Those relationships can provide a protective mechanism, as pet owners are both physically and emotionally healthier than their non-pet-owning peers. The veterinary profession should note the importance conveyed by the very nature of the human-animal bond. The implications these findings should have on how veterinarians support clients or market services are significant.—*Kathleen Ruby, PhD (Counseling Psychology)*

Source

Friends with benefits: On the positive consequences of pet ownership. McConnell AR, Brown CM, Shoda TM, et al. **J PERS SOC PSYCHOL** 101:1239-1252, 2011.