Researchers find pet kidney injuries are similar to human kidney injuries

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When evaluating early kidney injuries in people, doctors monitor blood level increases of creatinine, a waste product of muscle breakdown, to understand the severity of the injury. Creatinine is filtered by the kidneys, and small increases are an indication of early damage to vital kidney function. For pets suffering critical illness or injury, University of Missouri researchers have found that even tiny increases of creatinine in blood also could indicate acute kidney damage. Using human blood measurement guidelines for acute kidney injuries, the researchers believe they can now help pet owners better know the severity of their animals' illness.

"The concept of monitoring creatinine for kidney disease in dogs is not new to veterinary medicine," said Marie Kerl, associate teaching professor in the department of veterinary medicine and surgery in the MU College of Veterinary Medicine. "Dog kidneys and human kidneys function the same way; there are only slight structural differences. In people hospitalized with any critical illness, acute kidney injury can develop even if kidney function was normal at admission. Doctors can determine whether kidney injury is occurring by seeing even very small increases in creatinine previously thought to be insignificant. We undertook a study to determine if critically ill dogs showed a similar risk of early kidney injury. If a pet is hit by a car or attacked by a larger animal causing multiple injuries, the kidneys are very susceptible to damage since 25 percent of an animal's blood passes through the ! kidneys with every heartbeat."

Kerl and her colleagues performed a retrospective study of creatinine change in 164 injured dogs admitted to the intensive care unit at the University of Missouri Veterinary Medical Teaching Hospital. Researchers compared the animal medical records and creatinine levels to criteria used to evaluate human acute kidney injury. The researchers then developed a veterinary acute kidney injury staging system, which would indicate to veterinarians how increases of creatinine correspond to the animal's risk of death.

"One difference between human and animal medicine is that pet owners may have a different tolerance for how far they want to go with treatment," Kerl said. "Cost is always a concern, and while some animals can get better, many animals with multiple injuries will not. This kidney evaluation staging system would be another way for veterinarians to share recommendations based on the probable outcomes."

Kerl's paper, "Characterization of acute kidney injury in hospitalized dogs and evaluation of a veterinary acute kidney injury staging system," was published in the Journal of Veterinary Emergency and Critical Care. Co-authors include Meredith Thoen, who completed residency training in the MU Department of Veterinary Medicine and Surgery.

The research reported in the published paper is part of Mizzou Advantage, the five unique areas that set MU apart from other universities. The project contributes to the "One Health/One Medicine: The Convergence of Human and Animal Health," which expands on MU's pioneering work in the convergence of human and animal health and connects it with research and instruction in health care delivery, health policy, medical ethics, health care business models and the culture of healthy living.

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