

University clinical pharmacologist researching chronic lead intoxication in goats

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The Nile is a river in Egypt. Sometimes that river is polluted with industrial waste, such as lead, which can cause detrimental effects on local sheep and goats via the water supply.

Kansas State University's Ronette Gehring is an associate professor of clinical pharmacology in the of anatomy and physiology department of the university's College of Veterinary Medicine. She has joined a team of researchers from Egypt, Jordan and the United States in evaluating the effect of chronic lead intoxication in [goats](#). In December 2013, the researchers published "Effect of chronic lead intoxication on the distribution and elimination of [amoxicillin](#) in goats" in the *Journal of Veterinary Science*.

Gehring teamed up with other veterinary researchers at Iowa State University, Cairo University and the Jordan University of Science and Technology for the project, which was supported by the Egyptian Cultural and Educational Bureau. The group found that lead intoxication can impair the therapeutic effectiveness of the antibiotic amoxicillin in goats.

"Amoxicillin is used to treat various types of infections in animals," Gehring said. "The goats with lead intoxication show signs of kidney and liver damage, so we had hypothesized this damage would inhibit the excretion of amoxicillin, leading to higher drug concentrations in these animals."

The test involved intravenous and intramuscular administration of amoxicillin. Blood and urine samples were collected over a period of 10 weeks to measure serum protein and amoxicillin concentrations. The protein concentrations helped indicate levels of kidney damage while the amoxicillin levels helped to demonstrate how much of the antibiotic was absorbed for therapeutic purpose. Surprisingly, the lead-intoxicated goats actually had lower concentrations of amoxicillin compared to the healthy animals.

"We found that amoxicillin was more quickly disposed in the lead-intoxicated goats than in the [control group](#)," Gehring said. "We believe that goats with chronic lead intoxication would therefore need more frequent administrations of amoxicillin administration for the antibiotic therapy to be as effective as it is in the control group of healthy goats."

Gehring said a literature investigation had found similar research for lead poisoning in humans but not in animal subjects. As one of the first studies of its kind, she said that the effects of lead intoxication on drug disposition still warrant further investigation.

More information:

www.ncbi.nlm.nih.gov/pmc/articles/PMC3885732/

Provided by Kansas State University

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