# Suspected adverse reactions to oral administration of a praziquantel-pyrantel combination in captive cheetahs (*Acinonyx jubatus*)

**Katherine M. Whitehouse-Tedd** PhD

**Liesl Smith** BSc

**Jane A. Budd** BVMS

**Christopher G. Lloyd** BVSc, MSc

From Cheetah Outreach, Quinan House, Paardevlei, De Beers Street, Somerset West, Western Cape 7137, South Africa (Whitehouse-Tedd, Smith); the School of Animal, Rural and Environmental Sciences, Nottingham Trent University, Southwell, Nottinghamshire, NG23 0QF, England (Whitehouse-Tedd); the Breeding Centre for Endangered Arabian Wildlife, PO Box 29922, Sharjah, United Arab Emirates (Budd); and Two Feet Four Paws Veterinary Clinic, Al Durar Building, Dubailand Residence Complex, Dubai, United Arab Emirates (Lloyd).

Dr. Whitehouse-Tedd and Mrs. Smith contributed equally to the study.

Address correspondence to Dr. Whitehouse-Tedd (katherine.whitehousetedd@ntu.ac.uk).

## OBJECTIVE

To characterize adverse reactions to oral administration of a combination of praziquantel and pyrantel embonate or pyrantel pamoate, with or without oxantel embonate, in captive cheetahs (*Acinonyx jubatus*).

## DESIGN

Retrospective case series and case-control study.

## ANIMALS

16 captive cheetahs with signs of adverse reaction to oral administration of praziquantel and pyrantel, with or without oxantel embonate (affected group), and 27 cheetahs without such reactions (unaffected group), all from 3 independent facilities.

## PROCEDURES

Medical records and postmortem findings for affected cheetahs were reviewed and compared with those of unaffected animals. Anthelmintic doses administered, age, and sex of cheetahs were compared between groups.

## RESULTS

3 reactions in affected cheetahs were fatal, whereas the remainder ranged from mild to severe. Postmortem examination failed to reveal any disease processes or conditions to explain the deaths. No differences in anthelmintic dose were identified between affected and unaffected cheetahs for all facilities combined, and no correlation existed between dose and reaction severity. No association with sex was detected, but affected cheetahs were significantly younger than unaffected cheetahs. This difference was not significant after controlling for facility.

## CONCLUSIONS AND CLINICAL RELEVANCE

Cheetahs were concluded to have had an adverse reaction to the praziquantel-pyrantel combination because of temporal proximity of onset of clinical signs to dose administration, similarity of signs to those reported for toxicosis in other species for these drugs, and a lack of other disease process or environmental explanatory factors. A highly cautious approach to the use of this drug combination is recommended for cheetahs. (*J Am Vet Med Assoc* 2017;251:1188–1195)

Prevention of infection with endoparasites such as helminths via routine, regular anthelmintic administration is an accepted and common veterinary practice in zoological facilities that house cheetahs (*Acinonyx jubatus*).[1,2] However, evidence[3] suggests that a diagnosis-based approach may be a more effective means of controlling endoparasites in cheetahs. The alternative, and more traditional, approach involves the routine treatment of cheetahs with an anthelmintic every 2 to 3 months, regardless of infection status. This more traditional strategy is broadly advocated by most anthelmintic manufacturers and is supported by various international veterinary health organizations, including the South African Veterinary Association and British Small Animal Veterinary Association.[4,5]

Various drugs, or combinations thereof, are used as anthelmintics in cheetahs. These drugs are produced commercially for use in domestic animals such as cats and dogs but are used off-label in a variety of nondomestic species,[6] including cheetahs.[7] In cats and dogs, most of these drugs reportedly have high safety margins (maximum dose before clinical signs of adverse effects are observed) and are well tolerated, with minimal adverse effects. For example, praziquantel is a common anticestodal drug used in cats and dogs for which adverse effects following oral administration are uncommon.[8,9] The reported safety margin for oral praziquantel administration is up to 40 times the recommended dose in dogs and up to 10 times the recommended dose in cats.[8,9] Typically used in combination with praziquantel, pyrantel (for which pamoate or embonate salt is used as a carrier) has a slightly lower but still acceptable safety margin in dogs, with up to 7 times the recommended dose tolerated with no adverse effects.[8,10] Long-term (3-month) daily pyrantel administration at 50 mg/kg (22.7 mg/lb), PO, results in signs such as tachypnea, ataxia, and other toxic cholinergic effects,[8,10] whereas no signs are observed when administered daily at 20 mg/kg (9.1 mg/lb).[8,10]