

IMAGES IN...

Food/farmed animals

Cryptosporidiosis in an alpaca cria secondary to prolonged antimicrobial administration

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KEYWORDS

Antimicrobials, Cria, Cryptosporidia, Giardia, Zoonoses

DESCRIPTION

A 7-week-old alpaca cria presented with diarrhoea that had not responded to the owner's administration of cefotiofur (5 days of therapy), followed by trimethoprim-sulfamethoxazole (two 5-day courses of therapy), toltrazuril, probiotics and loperamide (all concurrent after the last course of sulfamethoxazole). The owner had initiated therapy after observing coccidia on an on-farm faecal exam they performed several weeks prior. Initial examination of the cria was unremarkable, with the exception of loose faecal consistency and mildly decreased body condition. The University of Tennessee Knoxville College of Veterinary Medicine Diagnostic Parasitology Laboratory detected *Cryptosporidium* sp. (Figure 1) and *Giardia* sp. (Figure 2) on two faecal centrifugal flotations using Sheather's sugar and zinc sulphate solutions.¹ The cria

was administered fenbendazole and bismuth subsalicylate, and faecal consistency improved in 6 days.

Coccidian species are the most commonly observed protozoal infections in crias.² Extended-duration therapy with sulphonamides is a risk factor associated with *Cryptosporidium* infections in crias.² While more camelid producers are performing on-farm faecal examinations, *Cryptosporidium* sp. and *Giardia* sp. can be missed on some faecal techniques and they are challenging to identify without specific training, as seen in Figures 1a and 2a, respectively.³ While flotation techniques may be ideal for gastrointestinal nematode egg screening, reliably diagnosing *Cryptosporidium* is difficult. Camelid clinicians and producers should be aware of these factors, as *Cryptosporidium* cases in alpaca crias have been linked to zoonotic infections, and *Giardia* also has zoonotic potential.⁴ Other risk factors that warrant a

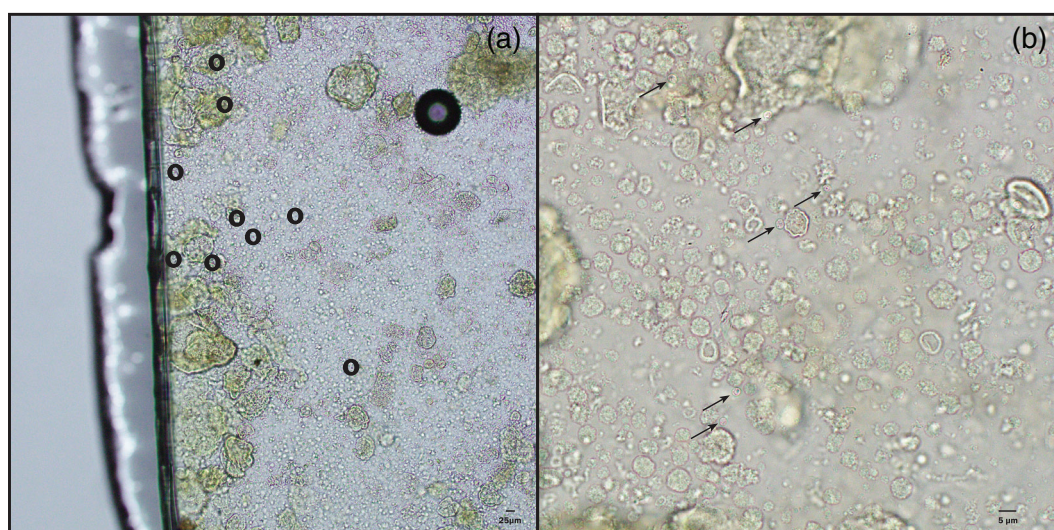


FIGURE 1 *Cryptosporidium* sp. oocysts (average diameter 4.5 µm) on faecal centrifugal flotation with Sheather's sugar solution from cria. (a) *Cryptosporidium* sp. oocysts (black circles) at 100× magnification. (b) *Cryptosporidium* sp. oocysts (black arrows) at 400× magnification

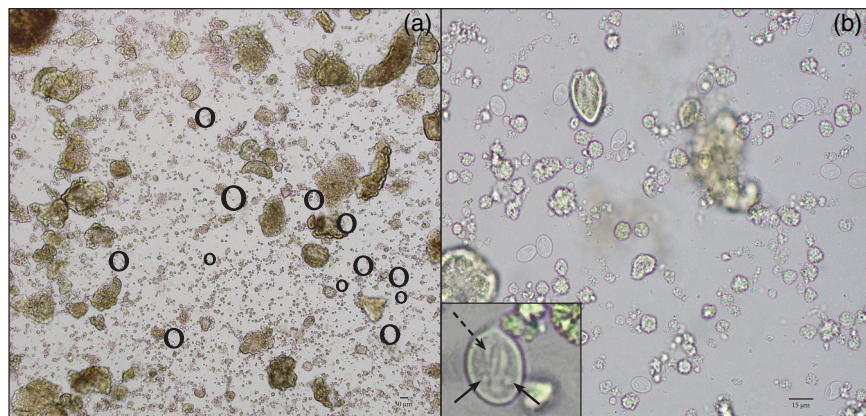


FIGURE 2 *Giardia* sp. cysts (average length 15 μ m) on faecal centrifugal flotation with zinc sulphate solution from cria. (a) *Giardia* sp. cysts (black circles) at 100 $\times$ magnification. (b) *Giardia* sp. cysts at 400 $\times$ magnification. Inset: *Giardia* sp. cyst with two nuclei (solid arrows) and axostyle/axoneme (dotted arrow) at 1000 $\times$ magnification

LEARNING POINTS/TAKE-HOME MESSAGE

- While faecal examinations performed on the farm by the client are becoming more frequent for llamas and alpacas, clients should be advised that detecting protozoan parasites such as *Cryptosporidium* and *Giardia* may be challenging.
- Clients and clinicians should be aware of the potential risk of *Cryptosporidium* in crias that present with diarrhoea that has been treated with multiple rounds of antimicrobials, as these may have led to disruption of the gastrointestinal microflora.
- *Cryptosporidium* and *Giardia* should remain a differential diagnosis for diarrhoea in camelids due to the risk of zoonotic transmission.

Cryptosporidium suspicion in crias include exposure to cattle and other mammalian hosts, host age and host immunity; however, crias with a history of non-responsive diarrhoea after extended treatment with antimicrobials require expert testing for *Cryptosporidium*.

AUTHOR CONTRIBUTIONS

Caroline Griffin and Joe S. Smith managed the clinical case. Heidi M. Wyrosdick and John J. Schaefer performed the faecal testing. All authors contributed to client education and preparation of the manuscript.

ACKNOWLEDGEMENTS

The authors wish to acknowledge Emily Ford for her editorial assistance.

CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

ETHICS STATEMENT

This case report is constructed from a retrospective analysis of medical records and as such does not require ethical approval.

FUNDING INFORMATION

The authors received no specific funding for this case report.

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How to cite this article: Wyrosdick HM, Griffin C, Schaefer JJ, Smith JS. Cryptosporidiosis in an alpaca cria secondary to prolonged antimicrobial administration. Vet Rec Case Rep. 2023;e685. <https://doi.org/10.1002/vrc2.685>

MULTIPLE-CHOICE QUESTION

Which of the following parasites may be challenging to diagnose on 100 $\times$ light microscopy of a faecal sample obtained from an alpaca cria?

POSSIBLE ANSWERS TO MULTIPLE-CHOICE QUESTION

- A. *Eimeria* spp. (approximately 24 μ m length)
- B. *Nematodirus* spp. (approximately 200 μ m length)
- C. *Cryptosporidium* spp. (approximately 4.5 μ m length)
- D. *Haemonchus* spp. (approximately 80 μ m length)

CORRECT ANSWER

C. *Cryptosporidium* spp. With a length of approximately 4.5 μ m, *Cryptosporidium* spp. can be challenging to identify on faecal examination.