Feline medicine self-assessment

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HISTORY

You are presented with two male, sibling Ragdoll kittens aged four and a half months and weighing 1.9 kg and 2.12 kg respectively. The owner feels that they are not growing as she would expect and that they have both shown intermittent mixed, mainly large intestinal, diarrhoea of two months' duration, with large quantities of mucoid stools, urgency and faecal tenesmus. This has partially responded to previous treatment with kaolin/probiotics, broad-spectrum anthelmintics (fenbendazole, Panacur [Intervet] at nine weeks of age and pyrantel/praziquantel, Drontal Cat [Bayer] three weeks previously) and dietary adjustment (Feline i/d, Hill's) from your colleague. The kittens have been vaccinated during a period of relative wellbeing. Malaise is also reported, and coincides with the episodes of most severe diarrhoea. Clinical examination notes poor body condition but is otherwise normal.

QUESTIONS

1. What are the differential diagnoses for this presentation?
2. How would you investigate?
3. You find the organism seen in Fig. 1 on a fresh faecal smear. What is your diagnosis?
4. What other methods of diagnosing this organism are available?
5. How would you treat the kittens?

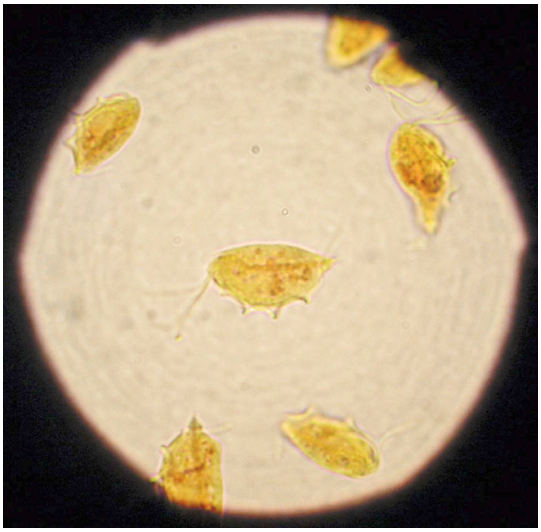

Fig. 1.

Feline medicine self-assessment

ANSWERS

1. The problem list for the presentation is (1) diarrhoea and (2) poor growth; the latter is quite possibly a consequence of diarrhoea, but it is important not to overlook the possibility of a systemic disease underlying both problems.

   Diarrhoea
   - Viral disease - feline parvovirus (unlikely here due to chronic course of disease without mortality), feline enteric coronavirus, torovirus
   - Bacterial disease - *Campylobacter* spp, *Salmonella* spp, *Clostridia* spp, *E. coli*, *Yersinia*
   - Protozoal disease - *Giardia* spp, *Tritrichomonas foetus*, *Isospora* spp, *Cryptosporidium* spp
   - Helminth disease - *Toxocara* spp
   - Husbandry issues - e.g. poor-quality food
   - Dietary sensitivity resulting from exposure to antigen during earlier episodes of diarrhoea - i.e. early stages of inflammatory bowel disease.

   Poor growth
   - Infectious disease
     - all the diseases listed above
     - feline infectious peritonitis (FIP)
   - Dietary problem, underfeeding, poor quality diet.

   The following diseases pertain to individuals with poor growth, but the likelihood of them being responsible here in two, albeit genetically related, individuals coincidentally is low. Furthermore, some are unlikely in the absence of other clinical signs; for example, megaoesophagus is very unlikely without regurgitation or pneumonia.
   - Cardiac disorders - e.g. congenital anomalies, endocarditis
   - Hepatic dysfunction - e.g. portosystemic vascular anomaly, hepatitis, glycogen storage disease
   - Oesophageal disease - e.g. vascular ring, megaoesophagus
   - Gastrointestinal disease - e.g. all diseases listed above, inflammatory bowel disease, foreign body, intussusceptions
   - Exocrine pancreatic insufficiency (EPI)
   - Renal disease - e.g. pyelonephritis, congenital renal disorder
   - Hormonal disease - e.g. hypoadrenocorticism, congenital hypothyroidism, pituitary dwarfism

2. In the first instance, it would be reasonable to assume that, first, these are not two kittens with coincidental individual diseases and, second, that the poor growth is secondary to the diarrhoea.

   The owner should be questioned further as to the kittens' nutrition to ensure that they are receiving sufficient amounts of a high quality food.
   Faecal analysis for both cats should be undertaken on a pooled, three-day sample in order to maximise sensitivity for detection of infectious organisms. Examination for nematode ova and protozoan parasites should be undertaken as well as bacterial culture for *Salmonella*, *Campylobacter* and *Yersinia*. Note that the presence of normal commensal organisms in faeces will not yield information of diagnostic significance - in a clinical setting, it will be impossible to determine whether *Clostridia* or *E. coli* are pathogenic or part of the normal bowel flora. Additionally, *Salmonella* and *Campylobacter* can often be found in the faeces of clinically unaffected dogs and cats; therefore, the significance of these is not always clear either. Faecal analysis was normal in this case with the exception of an organism like the one seen in the photograph, which was found on examination of a fresh smear made from a faecal swab.

   Basic haematology and biochemistry panels and FeLV/FIV status on both kittens would reassure the clinician of their underlying systemic health, but at this stage one does not need to extend the investigation to consider issues such as EPI.

   Feline enteric coronavirus (FeCoV) antibodies may be detected in serum and indicate exposure to the disease, but diarrhoea associated with this virus is usually brief and self-limiting, making it unlikely here. Feline parvovirus is also unlikely as it is associated with acute diarrhoea and high mortality. Torovirus diarrhoea is possible, and diagnosis can only be made clinically, but these kittens did not show the concurrent third eyelid prolapse that is normally present.

   FIP is possible in two highly bred kittens from the same household, although it would require a degree of coincidence for the two kittens rehomed to your particular client to become clinically ill simultaneously. FeCoV antibodies only indicate exposure to the virus, rather than confirmation that the current clinical sign of diarrhoea is due to either FeCoV or FIP. Further evidence for FIP may be identified from hyperglobulinaemia or anaemia if present, but again these are non-specific findings.

   Consideration of dietary intolerance could be made either by feeding a novel protein/carbohydrate diet or by endoscopy/biopsy; although the latter is probably more appropriate in an older kitten due to size constraints for endoscopy and the unlikely signalment (i.e. too young) for IBD here.

3. *Tritrichomonas foetus*. This is a *Tritrichomonas trophozoite,* which can be differentiated from *Giardia* by its undulating membrane and erratic movement, as opposed to the typical 'falling leaf' motion seen with Giardia (Steiner, 2005).

4. A PCR test for *Tritrichomonas foetus* is available. A specific culture system has also been used in the

USA. Sparkes *et al*. in the relative sensitivities of the different tests, with direct smears finding positive in 5/36 cases, culture in 20/36 and PCR in 34/36. Therefore, PCR offers the greatest sensitivity, but, due to intermittent shedding, a negative result does not completely preclude infection; a three-day sample is advisable to improve sensitivity. Antibacterials should not be used in the two weeks prior to testing, and samples should not be contaminated with cat litter, which may interfere with the PCR assay.

Tritrichomonas foetus was first reported in the UK by Mardell and Sparkes (2006) and has subsequently been shown to be present in 14-20% of samples from diarrhoeic cats subjected to PCR testing (Gunn-Moore *et al*., 2007; Gunn-Moore & Tennant, 2007); this prevalence increases to 31% in purebred cats with diarrhoea (Gunn-Moore & Tennant, 2007). Most cases are seen in young cats/kittens from multi-cat environments.

5. One option with *Tritrichomonas* diarrhoea is to allow it to resolve naturally. Use of a highly digestible or high fibre diet may be sufficient to control the clinical signs in some cats (Sparkes *et al*.). This has been documented to have been partially effective after eight weeks in one UK case (Mardell & Sparkes, 2006). However, a study by Foster *et al*., (2004) reports a median time of nine months for complete resolution of diarrhoea in 22/26 cats and this may not be acceptable to some owners.

   In this case, the diarrhoea had been continuing for two months and the owner felt the cats were significantly depressed, so treatment had to be considered. Unfortunately, the organism is generally resistant to conventional anti-protozoal drugs such as fenbendazole and metronidazole. Gookin *et al*. (2006) have shown **ronidazole** to have good efficacy for *Tritrichomonas foetus* and this drug would currently be considered to be the treatment of choice; it is similar but not identical to metronidazole.

   Ronidazole is **not licensed** and should only be used with signed owner consent. It appears to be relatively safe in cats, but a small number of patients have shown neurological side effects, similar to those which may be seen with metronidazole; however, these usually resolve when the drug is stopped (Sparkes *et al*.).

   The study by Gookin *et al*., (2006) used a dose rate of 30-50 mg/kg q12-24 h for 14 days. Awareness of drug safety would dictate using the lower end of this range and Sparkes *et al*. suggest that 30 mg/kg q24 h may be adequate, reducing this further to 10 mg/kg q24 h for small kittens or cats with hepatic dysfunction. It is essential to weigh the cat and order reformulated capsules to allow an exact dose to be given - this can be done from Nova Laboratories (0116 223 0099) on a named-patient basis. A two-week course is usually adequate. Adverse reactions should be reported to the Veterinary Medicines Directorate on the appropriate form; additionally, the Feline Advisory Bureau (FAB) requests that case information on any potential adverse effects be sent to Professor Gunn-Moore (danielle.gunn-moore@ed.ac.uk) so that they too may monitor the use of ronidazole.

   Ronidazole is highly teratogenic and should not be given to pregnant queens or queens about to be put to stud (Sparkes *et al*.). Likewise, it should be handled with care by humans; the capsules should not be opened and gloves should be worn, including when clearing up any vomit that is produced soon after administration. Ideally, women of childbearing age should leave administration of the capsules to another member of the family. Alternatively, cases where these issues cannot be circumvented may be best treated conservatively without drug therapy.

   The author has used ronidazole in reformulated capsules based on accurate weights at 30 mg/kg q24 h for two weeks in six cases so far, with good efficacy and no observable adverse effects. Given that *Tritrichomonas* infection may be clinically silent, and the concerns over ronidazole therapy, there is probably no need to treat non-diarrhoeic in-contact animals in the first instance. The author's current approach is only to treat affected animals, where other management has failed over 1-2 months.

   Consideration should be given to the possibility of gastrointestinal intolerance to dietary antigens ingested during the period of diarrhoea and this could be one explanation for diarrhoea continuing beyond the treatment period. Therefore, before continuing ronidazole in such cases, it would be prudent to repeat the PCR to see if infection persists and/or introduce a novel protein/carbohydrate diet.

Further information as well as a useful hand-out for owners which doubles as a consent form is available from FAB (www.fabcats.org) or danielle.gunn-moore@ed.ac.uk

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