

SUSPECTED PARASITIC GASTRITIS IN A YOUNG CAT

A seven month old domestic short-haired cat had undergone extensive work-up for chronic vomiting. There had been no response to treatment that included routine worming. An exploratory laparotomy was performed: no gross lesions were identified, so biopsy samples of stomach, duodenum, jejunum and ileum were taken and submitted to NZVP. Significant histologic changes were present in the gastric biopsy, which was diagnosed with a severe chronic eosinophilic gastritis including many globular leukocytes.

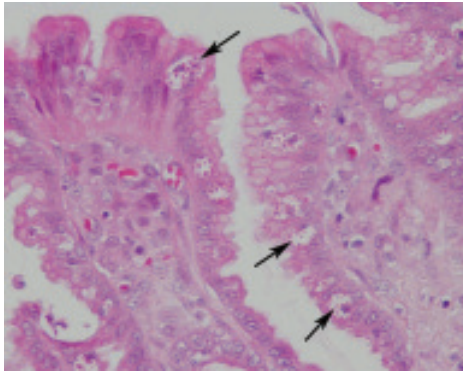


Photo showing hyperplasia of the gastric mucosa with many globular leukocytes (arrows). No parasites were found on the biopsies, which occurs in about 50% of cases.

Globular leukocytes are cells of uncertain cellular origin, most commonly seen within the intestinal mucosa of large animal specimens associated with gastrointestinal parasitism. Their presence in this feline gastric biopsy, along with eosinophilic inflammation, strongly suggested a parasitic cause for the chronic gastritis and clinical signs. *Ollulanis tricuspis* is the best known stomach parasite in cats. These are small Trichostrongyle nematodes that are viviparous. The larvae are thought not to survive the intestinal environment, so infection typically can't be detected by routine faecal examination. Transmission of infection is through ingestion of larvae in vomit. The true prevalence of infection is uncertain as the organisms appear to be well tolerated by many cats, and clinical signs or gross pathology are uncommon. Surveys published in the New Zealand Veterinary Journal in 1973 and 1984 suggested that the prevalence was 4% and 13% respectively but the number of cats evaluated in each case was relatively small – high density populations such as colonies and breeding catteries may also exhibit higher prevalence due to the

greater potential for exposure. Vomiting, anorexia and weight loss have been reported in infected cats, and in some cases may be severe.

Diagnosis of suspected cases is best performed by examination of vomited material, preferably from an empty stomach. This method lacks sensitivity in that a negative result does not rule out infection, and multiple samples may be required. Suggestive histologic changes may be present on gastric biopsies, as described above, although in one study (Veterinary Pathology, 1983) only 50% of biopsies from cats with confirmed infection included sections of the actual parasites.

There is little published on effective treatment of infection. In a recent paper from the Journal of Comparative Pathology (2006), two cats identified with *O. tricuspis* infection were treated with oral Fenbendazole (50mg/kg) for 5 days, and the vomiting subsequently resolved. The young cat described here showed clinical improvement following treatment with Ivermectin, although it took several months for the vomiting to resolve completely.

Many thanks to Dr Katherine Allen for providing this case and the clinical follow-up!

Adrienne French

NEXT ISSUE:

- Tips for Packaging and Sending Samples
- Protocol for sending Quarantine Samples
- Diagnosis of FIP
- And much more ...

FACIAL ECZEMA RISK ASSESSMENT

After a hard drought in some parts of the country this summer, the cool evenings and rains of the autumn have finally arrived. While this brings some relief for farmers that have been short of feed for weeks, these conditions are ideal for the proliferation of *Pithomyces chartarum*, the fungus responsible for producing sporodesmin, the toxin involved in facial eczema. Facial eczema is a disease that is a major production limiting factor in many areas of New Zealand. Its high prevalence in this country is unique; in other parts of the world, facial eczema only occurs in small pockets under specific climatic conditions.



The disease commonly known as facial eczema is actually a secondary photosensitivity which occurs due to liver damage caused by sporodesmin. Exposure to sporodesmin can cause varying syndromes depending on the dose and time frame of exposure.

Acute exposure to high levels of sporodesmin, for instance as would occur when hungry animals are allowed to graze a pasture with high levels of fungus growth, causes an acute haemolytic syndrome. In this syndrome, animals are found dead with few or no premonitory signs. They may have gross haematuria and anaemia. Histology on these suddenly dead animals may be unrevealing as there has been no time for changes characteristic for sporodesmin toxicity to occur. However, animals which survive the initial insult will likely have an elevated GGT which would be appreciable on serum chemistry.

Exposure to lower levels of sporodesmin results in the more classical disease, where the toxic insult results in marked biliary proliferation, cholestasis, and liver fibrosis. These animals have elevated GGTs and have clinical evidence of photosensitivity. Animals with advanced liver damage,

often as the result of accumulated exposure over a number of seasons, may have other evidence of liver failure such as ill thrift and hypoproteinaemia.

Subclinical disease occurs with chronic exposure to low levels of sporodesmin. These animals have histologically mild biliary proliferation with mild fibrosis and mildly to moderately elevated GGTs. While these animals are initially clinically normal, the changes to the liver are cumulative over a number of seasons and eventually these animals will likely become affected with the clinical disease.

Zinc administration has long been used as a tool to reduce the effects of sporodesmin toxicity. While advising about treatment is beyond the scope of a veterinary pathology laboratory, we are able to help by using serum zinc levels to monitor whether supplementation has been adequate to achieve a protective effect.

Below is a chart summarizing tests that are available to you that may be helpful during facial eczema season:

Test Name	Sample Required	Information Yield
GGT (Gamma-glutamyl transferase)	Serum (red top tube)	Gives an idea of the level of biliary epithelial damage Only high during active damage to biliary epithelium
Histology	Liver (usually post mortem)	Gives an idea of level of chronic change (over several seasons) May not detect peracute toxicity
Haematology	EDTA blood (purple top tube)	Good if peracute toxicity with haemolysis suspected (especially if haemoglobinuria is present)
Spore count	Pasture	Enables prediction of potential exposure before animals are moved on to new pasture Exposure dependent on grazing pressure
Spore count	Faeces	Allows assessment of actual exposure/number of spores ingested
Serum zinc	Serum (red top tube)	Allows assessment of efficacy of zinc supplementation which mitigates the effects of sporodesmin.

Isobel Gibson

FACIAL ECZEMA SPORE COUNTS:

There are two methods commonly used to estimate the facial eczema risk by way of counting *Pithomyces chartarum* spores.

1. PASTURE WASH SPORE COUNT METHOD:

Determining the number of spores on pasture samples provides an estimate of the danger of the pasture to grazing animals. Pasture samples are taken and spores are washed from the pasture with water and counted using a haemocytometer. The test is limited by the inherent variability of spore distribution throughout a paddock, and the level to which stock are actually grazing down to. Results are reported as *Pithomyces chartarum* spores per gram.

The pasture wash method provides an assessment of potential exposure.

Sample collection:

Collect pasture samples into plastic or paper bags by cutting a handful of pasture leaves about 1cm above ground level from at least five places about 10m apart. Avoid getting soil in the sample as this makes counting difficult. Avoid parts of the paddock sheltered by trees or hedges, and sample from an area of even slope. If the same site is sampled regularly, always take the same route across it. We require at least 60g of pasture for a more accurate count.

If counts can't be carried out the day of collection, the sample should be held in a refrigerator overnight.

2. FAECAL SPORE COUNT METHOD:

A more recently used method is counting spores in faeces. *Pithomyces chartarum* spores survive the GI tract keeping their characteristic shape, and can be counted using the same equipment as pasture wash samples. This method provides an accurate count of the number of spores animals are actually ingesting.

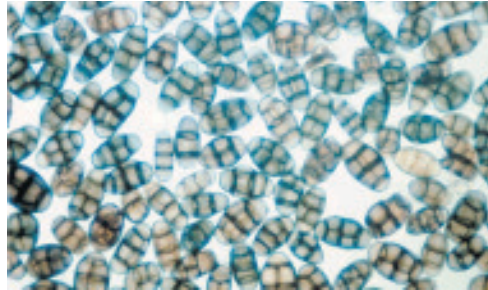


Fig 1. *Pithomyces chartarum* spores under the microscope.

Faeces are collected in the same manner as for a FEC and are usually pooled in lots of 6-10 samples, mixed in a quantity of water and counted under a haemocytometer. Wet faeces counts are a potentially inaccurate comparison due to faecal consistency variation between species and within a group of animals. A calculation is used to convert spores per gram of wet faeces, into spores per gram of dry faeces.

Results are reported as *Pithomyces chartarum* spores per gram of dry faeces.

Faecal spore count provides a measure of recent exposure.

James Connell, BSc

ACUTE RENAL FAILURE DUE TO NEPHROTOXINS IN COMPANION ANIMALS

Driving passed a winery to work and back every day reminds me that it is grape harvest time again and also reminds me of a sad case we dealt with in March/April last year. A 2 year old Mastiff presented to the veterinarian after vomiting for 3 days. His owners ran a winery and the dog had eaten 'must', which is all the skins, seeds and other waste left after pressing the grapes, and a chicken carcass. The main differentials from clinical exam were pancreatitis and intestinal obstruction. Biochemistry revealed severe azotaemia (urea 82.3 mmol/l [RR 2-10.2], creatinine 2178 umol/l [RR 45-135]), hyperkalaemia and hypochloreaemia. The dog was in acute anuric renal failure and unfortunately he died despite treatment. Grapes, sultanas and raisins are recognized as being toxic to dogs, but are an uncommon cause of acute renal failure. If you have clients with dogs at wineries then it would be wise to make them aware of this, as there is information on the web about grape seeds and grape seed oil being beneficial to humans, and this may be extrapolated to pets.

At about the same time we also had cases of nephrotoxicity due to cholecalciferol, NSAID's and ethylene glycol. The common factor was the marked azotaemia and increased potassium. Some were anuric but they can also be polyuric, depending on severity and stage they are at. Other distinguishing features can be that the cholecalciferol cases have marked hypercalcaemia and sometimes hyperphosphataemia, and the ethylene glycol cases often have hypocalcaemia and calcium oxalate monohydrate crystals in the urine.

Potential nephrotoxins discussed at the WSAVA conference in Sydney in a paper by Dr Dennis Chew were:

- o NSAID's particularly in association with anaesthesia & hypoperfusion
- o Ethylene glycol
- o Antibiotics (aminoglycosides, amphotericin B, sulfonamides if dehydrated, IV tetracyclines)
- o Easter lily in cats
- o Grapes/Raisins in dogs
- o Cholecalciferol rodenticides or dietary vitamin D supplementation

There are also other "non-toxic" causes of acute renal failure and also a significant number of cases which fall into the idiopathic category.

Reference: *Acute Intrinsic Renal Failure (AIRF) – Causes and Prevention.* D.J Chew, WSAVA, Sydney, 2007

Thanks to Dr Tony Austwick, Tauranga-Katikati Veterinary Services for the grape toxicity case.

Jenni Donald

PASTURE FOR ANIMAL NUTRITION

The following article has been reproduced in full with permission from Hill Laboratories, "AGREPORT" Issue 2, 2007.

New Zealand Veterinary Pathology refers all pasture and feeds to Hill Laboratories.



Feed testing to determine protein, carbohydrate and energy content of pastures is a critical component of managing optimal animal production. It is however equally essential that the mineral nutrients are also determined. A mineral deficiency or imbalance will limit animal performance

For example, an element such as potassium is graphed according to the plants requirements only, as the plant requires typically 2.5-3.5%, and the animal only 1.0%. Other elements such as sodium and selenium are assessed according to animal requirements, since they are not considered essential for pasture growth.

Recently we have adjusted some of the medium ranges for a number of elements where these are pertinent for animal health requirements e.g. Selenium. In some cases the medium ranges on a Hill Laboratories pasture test report will be slightly different from published scientific papers. In doing this, the laboratory is attempting to build in some "risk-management" to allow for variables such as seasonal and spatial differences. While all care is taken to set ranges in consultation with industry, these are intended as guidelines only and analytical results should be interpreted carefully along with all other farm observations.

Analysis	Level Found	Medium Range	Low	Medium	High
Nitrogen (%)	3.3	4.0 - 5.0			
Phosphorus (%)	0.38	0.38 - 0.45			
Potassium (%)	3.0	2.5 - 3.0			
Sulphur (%)	0.32	0.30 - 0.40			
Calcium (%)	0.47	0.60 - 1.00			
Magnesium (%)	0.20	0.20 - 0.30			
Sodium (%)	0.15	0.15 - 0.30			
Iron (mg/kg)	94	100 - 250			
Manganese (mg/kg)	150	60 - 150			
Zinc (mg/kg)	31	30 - 50			
Copper (mg/kg)	9	10 - 12			
Boron (mg/kg)	5	10 - 15			
Molybdenum (mg/kg)	1.1	0.50 - 1.2			
Cobalt (mg/kg)	0.08	0.10 - 0.20			
Selenium (mg/kg)	0.06	0.08 - 0.15			
Chloride (%)	1.3	0.30 - 2.4			
Dry Matter (%)	16.4	12.0 - 25.0			
Crude Protein (%DM)	22.0	20.0 - 30.0			
Acid Detergent Fibre (%DM)	25.8	20.0 - 30.0			
Neutral Detergent Fibre (%DM)	40.5	30.0 - 45.0			
Ash (%DM)	7.4	7.0 - 14.0			
Digestibility (DOMD) (%)	160.0	65.0 - 100.0			
Metabolisable Energy (MJ/kg)	10.6	9.0 - 12.0			
Soluble Sugars (%DM)	10.4	4.0 - 15.0			
Grass Stagers Index	1.9	<1.8 recommended, >2.2 increased risk			
K/Na Ratio	20	<10 recommended, >20 increased risk			
DCAD	255	<200 recommended, >200 increased risk			
Ca/P Ratio	1.2	>1.5 recommended, <1.2 increased risk			

irrespective of the quantity and quality of dry matter ingested. Hill Laboratories has a range of profiles that measure both of the above critical factors and when combined with the Animal Dietary Mineral Balance (ADMB) report provide a very full set of information that can be used in feed budgets and all animal health decisions.

Naturally animal tests will always be the most accurate measure of animal health status for the animals tested, but feed analysis certainly offers advantages as a general assessment of the diet for all animals in the herd.

Our mixed pasture analysis histogram report displays results as low, medium or high. This is defined by the nutrient level that is required for either plant or animal – whichever is the highest.

Analysis	Daily Intake	Daily Req.	Nutrient Bal.	Deficit	Satisfactory	Surplus
Nitrogen	528 g	560 g	-32 g			
Phosphorus	61 g	77 g	-16 g			
Potassium	472 g	240 g	232 g			
Sulphur	51 g	40 g	11 g			
Calcium	75 g	123 g	-48 g			
Magnesium	32 g	40 g	-8 g			
Sodium	24 g	40 g	-16 g			
Iron	1500 mg	860 mg	540 mg			
Manganese	2400 mg	800 mg	1600 mg			
Zinc	496 mg	640 mg	-144 mg			
Copper	144 mg	160 mg	-16 mg			
Boron	80 mg	0.0 mg	80 mg			
Molybdenum	18 mg	5.8 mg	12.4 mg			
Cobalt	1.3 mg	1.8 mg	-0.3 mg			
Selenium	1.0 mg	1.8 mg	-0.8 mg			
Chloride	208 g	180 g	48 g			
Species	Dairy	400	(Assumed)			
Live Weight	kg	16	(Assumed)			
Daily Intake	kg	7	(Assumed)			
Calving Month	Period	Peak Lactation	(Assumed)			
Grass Stagers Index	1.9	<1.8 recommended, >2.2 increased risk				
K/Na Ratio	20	<10 recommended, >20 increased risk				
DCAD	255	<200 recommended, >200 increased risk				
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An example of the Extended Feed Profile on dairy pasture is shown as well as the additional (free) ADMB report for peak lactation cows.

For more information on these tests, please contact Hill Laboratories on (07) 858 2000 or visit the Hill Laboratories website on www.hill_laboratories.com