Rabbit Urinary Disease

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Lecture outline

- Introduction to rabbit urinary system
- Approach to “Sludgy bladder” syndrome
- E. cuniculi
- Management of the rabbit with CRF

Urinary anatomy

- Unipapillate (rabbit)
- Multipapillate (human)

Calcium physiology in rabbits

- Rabbits passively absorb all dietary calcium (independent of vitamin D)
- Blood calcium levels are therefore higher than for other species
- The kidneys play an important role in controlling blood calcium levels by regulating excretion
- 45-60% of calcium is excreted via the kidneys compared to <2% in other mammals

Causes of urinary disease include

- Bacterial infections (Pasteurella and Staphylococcus)
- E. cuniculi
- Amyloidosis
- Benign embryonal nephroma
- Renal carcinoma
- Lymphoma

“Sludgy bladder” syndrome

- Polycystic kidney syndrome in New Zealand whites
- Renal agenesis in Havana rabbits
- Toxins as in other species
- Hypotension
- Hypertension
“Sludgy bladder”

- High levels of calcium in urine?
- Inadequate bladder emptying
- Calcium crystals build up in bladder
- Cystitis
- Dehydration

Causes of “Sludgy bladder”

- Renal damage
- High calcium diet?
- Dehydration
- Obesity
- Pain
- Neurological deficit

Presentation

- Urine scalding
- Incontinence
- Discoloured urine
- Gut stasis
- Anorexia
- Lethargy
- Weight loss

History

- Complete husbandry history
- Diet
- Changes in environment
- Companion rabbits
- Opportunities to exercise
- Standard medical history

Clinical exam

- Full clinical exam
- Palpate kidneys (unless hidden in fat) and bladder
- Neurological exam may be indicated BUT
- Rabbits are prey animals so may not react

Urinalysis

- Dipstick
- Specific gravity (1.003-1.036)
- Sediment
- Normal rabbit urine may contain porphyrin pigments
- Alkaline pH 7.6-8.8
- Trace proteinuria
Urinalysis

- Calcium carbonate and oxalate crystals are normally seen in rabbit urine
- Rabbits with “sludgy bladder” pass urine with a consistency of cement
- Cystocentesis may be unrewarding in these cases

Urinalysis

- Measuring urine protein creatinine ratio (0.11-0.14) may detect early signs of renal damage
- Normal urine GGT levels have recently been determined and may be an indicator of renal disease (2.7–96.5 IU/l)
- Urine culture and sensitivity may also be indicated

Bloods

- Changes in biochemistry are only seen when >75% of renal function is lost
- Urea (variable)
- Creatinine
- GGT
- Phosphorus

Abdominal X-rays

- Urea (variable)
- Creatinine
- GGT
- Phosphorus

Negative contrast retrograde urethrogram

Positive contrast retrograde urethrogram
Intravenous urogram

Ultrasound

Nephroliths or ureteroliths

CT

Cystoscopy

Treatment options

- Associated with high blood calcium levels?
- XS dietary calcium
- XS dietary Vitamin D
- Or consequence of renal damage

- Useful for evaluation of bladder mucosa
- Detection of polyps or neoplasia
- Bladder flushing may be performed under endoscopic guidance

Medical
Flush bladder
Surgical
**Fluid therapy**
- 100ml/kg/day maintenance
- Intravenous route preferred
- Alternatively subcutaneous with addition of hyaluronidase
- 1500IU/L fluids

**General nursing care**
- Syringe feeding may be necessary to prevent gut stasis and increase fluid intake
- Grooming
- Treatment of associated pododermatitis

**Analgesia**
- NSAIDs may be used if there are no underlying renal concerns
- Meloxicam <0.6mg/kg q12hrs
- Buprenorphine 0.05mg/kg q6-8hrs

**Treat urinary infections**
- Ideally base antibiotic choice on culture and sensitivity
- Co-trimoxazole 30mg/kg PO q12 hrs is a good first-line choice

**Reduce dietary items high in calcium**
- Alfalfa hay
- Pellets
- Clover
- Carrot tops
- Goosegrass
- Kale
- Sowthistle
- Broccoli
- Cauliflower
- Spear thistle
- Shepherd’s purse
- Swiss chard
- Beet greens
- Endive
- Bok choy

**Increase water intake**
- Provide multiple water sources both in bottles and bowls
- Add water to greens
- Add water to pellets
**Encephalitozoon cuniculi**

- *E. cuniculi* is a small intracellular protozoal parasite
- It is best known for causing disease in rabbits, but has also been reported in other species including primates, dogs, cats, guinea pigs and even birds
- It is potentially a *zoonotic* infection, and may cause serious disease in immunosuppressed individuals
**E. Cuniculi pathogenesis**

1. Spore ingested
2. Spore infects GI epithelium
3. Spore travels via blood stream to target organs

**Clinical signs of E cuniculi**

- Neurological signs are most common especially a head tilt
- Urinary incontinence
- Weight loss
- Anorexia
- Lethargy
- Ocular lesions

**Serological tests**

- Spore is ingested
- IgM levels detectable • Day 17
- IgG levels detectable • Day 21-28

**Other diagnostics**

- Spores may be excreted intermittently in the urine 3-5 weeks following seroconversion
- PCR tests are available
- Histological changes in the kidney may be seen 4 weeks following seroconversion
- Histological changes in the brain may be seen 8 weeks following seroconversion

**E cuniculi treatment**

- Fenbendazole 20mg/kg once daily for 28 days has been shown to successfully treat E. cuniculi
- Preventative courses of 9 days have also been advocated

**Renal failure**
Renal failure

May be acute or chronic (usually in older rabbits)

- Anorexia
- Lethargy
- Weight loss
- PUPD
- Bruxism
- Gut stasis

Diagnosis of renal failure

- Blood urea insensitive in rabbits as can be affected by caecal microflora urea metabolism
- X-rays and ultrasound may show renal changes
- Renal biopsies are necessary to confirm
- Laparoscopic biopsies may be preferred
- Check blood pressure?

Management of renal failure

- Similar approach to cats
- Palliative care
- Reduce feeding of high calcium items in diet
- Increase fluid intake
- ACE-inhibitors

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Rabbits often do not show signs until urinary disease is advanced
- Do not underestimate severity of disease – long courses of treatment may be required
- Always look for an underlying cause

THE END!