

SMALL RODENTS: COMMON DISEASES

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Small pet rodents, such as rats, hamsters and gerbils, are frequently presented to veterinarians for a variety of problems. Pet rodent husbandry and common diseases differ substantially from rodents kept in laboratory settings. Most small pet rodents live to an old age, and therefore degenerative disorders and neoplasia are more commonly seen than in lab rodents. On the other hand, the diet of pet rodents is often insufficient and diet-related disorders such as obesity are common. Being familiar with the natural history, dietary and husbandry requirements is critical for veterinarians in order to provide pet owners with the correct advice. Being able to recognize common diseases in small pet rodents will allow veterinarians to make an accurate diagnosis and offer treatment options.

Most small pet rodents are social animals (except Syrian hamsters) and should be kept in groups whenever possible, to allow for expression of normal behavior and well-being. However, in order to prevent uncontrolled reproduction either same gender groups should be housed together or males should be neutered. Neutering hamsters is more challenging compared to rats, since they do not possess a prominent scrotum and their testicles move freely through the inguinal rings. Spaying female rats is recommended whether or not they are kept with male rats, since the spayed female rats have a lower risk of developing mammary neoplasia and uterine disorders (e.g. endometritis). If these are avoided, it substantially extends the life-expectancy of rats. As an alternative to surgical sterilization, long-acting hormone implants (e.g. GnRH agonists (deslorelin)) are frequently used to achieve infertility. Syrian (golden) hamsters are solitary animals, and should never be kept in groups. In contrast dwarf hamsters are social, and can be kept in groups.

Housing of small rodents is similar and sufficient space and ventilation should be ensured. Wood shavings work well as bedding for small rodents, as they are absorbent and provide foraging material. A variety of products are available to provide a stimulating environment, such as chewing blocks, wooden sticks, cardboard tubes, etc. Providing enrichment is important. Small rodents are prey species and therefore providing shelter in the form of huts, tubes or boxes is important. The cage should be kept in a low traffic area and drafts should be avoided.

The diet of small rodents differs by species. Rats, gerbils and hamsters are omnivores and should be offered a commercial pelleted diet, which can be supplemented with a variety of fruits, vegetables, and occasional animal protein such as cooked chicken breast, egg white or low fat cheese. Supplementation with vitamins or minerals is not necessary for small rodents if a balanced diet is offered. Fresh drinking water should be available at all times.

RATS

- Average life span = 1.5–2.5 years
- Gestation period = 19–21 days
- Estrus cycle = 4–5 days, continually polyestrous
- Average litter size = 4–14, weaning at 21–28 days
- Average weight = males: 350-500g, females: 250-300g
- Heart rate = 250–490 beats/min
- Respiratory rate = 70–115 breaths/min
- Temperature = 96.9–99.5°F (35.9–37.5°C)

Common diseases:

Respiratory disease

Differentiate between acute and chronic respiratory disease in rats. *Streptococcus pneumoniae*, *Corynebacterium kutscheri*, *Mycoplasma pulmonis*, and sialodacryoadenitis virus (SDV) (co-) infections are common in rats. Multifactorial disorder, immune status, concurrent disease and husbandry are risk factors. The clinical signs include nasal discharge, snuffling, chromodacryorrhea (red tears), dyspnea, rough hair coat, torticollis, and death. Acute pneumonia can occur in young rats, and *Streptococcus pneumoniae* and *Corynebacterium kutscheri* are often the predominate pathogens. Septicemia may develop. Treatment includes: Amoxicillin/clavulanic acid (15-20 mg/kg PO, SC q12h), (*safe to use in rats*), azithromycin (15-30 mg/kg PO q12h), and doxycycline (5-10mg/kg q12h). Oxygen therapy, saline nebulization and supportive care should be provided, if indicated. Chronic pneumonia is common in older rats with a history of respiratory problems in the past. Treatment for chronic pneumonia includes: enrofloxacin (10 mg/kg PO q12h) plus doxycycline (5 mg/kg q12h); azithromycin (30 mg/kg PO q24h), as well as oxygen therapy, saline nebulization and supportive care if indicated. In chronic cases the prognosis is guarded, due to the severity of the underlying lung pathology. Diagnostic imaging is recommended to evaluate the extent and severity of the lower respiratory tract disease. Treatment with antibiotics is often required long-term, in order to prevent reoccurrence of clinical signs. A cure is not achieved. Optimize husbandry and nutrition and minimize stress.¹

Dermatologic disorders (Mammary gland tumors, dermatitis, alopecia)

Alopecia may result from barbering, trauma, dermatophytes, or ectoparasites. Benign fibroadenomas of the mammary glands are the most common cause for subcutaneous masses. The mammary tissue in rats is widespread and mammary gland neoplasia can occur in many areas of the body. Surgical removal often results in local cure, but reoccurrence at other sites of the body is common. Ovariohysterectomy is recommended to reduce the chance of recurrence. Alternatively, a GnRH-agonist can be administered (i.e. Deslorelin implant). Bacterial infections may respond to amoxicillin/clavulanic acid, cephalexin (safe in rats) or trimethoprim-sulfa drugs. Itraconazole or terbinafine should be used for treatment of dermatophytosis. Ivermectin or selamectin should be used for treatment of ectoparasites. E-collars and

separation of cage mates may be necessary, in order to prevent self-trauma or con-specific trauma.

Neuromuscular disorders

Bacterial infections, viral infections, neoplasia, poisoning, and trauma to the brain, ear, or spinal cord may cause ataxia, paresis, seizures, or torticollis. Pituitary adenomas are common in older rats. Central vestibular signs are seen. Treatment can be attempted with cabergoline, which may lead to temporarily reduction in size of the pituitary gland.

HAMSTERS

Syrian hamsters and dwarf hamsters are the most common type of hamsters kept as pet. Syrian (syn. Golden; *Mesocricetus auratus*) hamsters are larger, solitary and nocturnal. The group of dwarf hamsters consists of several different species (*Phodopus spp*), with the Campbell's dwarf hamster, Djungarian (syn. Russian or Siberian (dwarf)) hamster and Roborowski hamster being the most common.

- Average life span = 1.5–2 years
- Gestation period = 15–18 days
- Litter size is 4–12 pups, weaning at 20–25 days
- Do not handle the young during the first 7 days of life
- Estrous cycle is 4 days, sexual maturity is reached at about 6-12 weeks of age
- Weight = 85–150g (Syrian hamster), 25-50g (dwarf hamster)
- HR = 250–500 beats/min
- Respiratory rate = 35–135 breaths/min
- Temperature = 98–99°F (37–38°C)

Common diseases:

Alopecia

Hair loss and skin lesions are common in hamsters. Dermatophytoses, ectoparasites, trauma from cage mates (in Syrian hamsters predominately) and neoplasia should be considered as common differentials. Demodicosis is common in immunocompromised and/or older hamsters. Deep skin scrapes are necessary for a diagnosis and should be performed under general anesthesia. Treatment with oral ivermectin (0.2 mg/kg PO q24h) is recommended by the author.² Alternatively, selamectin (15-20 mg/kg topical q14-21 days) has been recommended. Treatment should extend beyond resolution of clinical signs.

Enteritis

Inappropriate oral antibiotic therapy, will lead to dysbacteriosis and overgrowth of opportunistic pathogens, such as *Clostridium difficile* or *Escherichia coli*. *Salmonella typhimurium* and *S. enteritidis* can cause enteritis in hamsters. Clinical signs are similar and include diarrhea, perianal soiling, dehydration, emaciation and poor fur condition. Empirical treatment is often necessary. The prognosis is guarded to poor. Treatment for enteritis in hamsters includes supportive care (nutritional support and fluid therapy)

as well as antibiotic therapy. Administer doxycycline or metronidazole if clostridial overgrowth is suspected. Administer trimethoprim-sulfa if clostridial overgrowth is less likely. Treatment of Salmonellosis is not recommended due to the zoonotic potential from the development of a carrier state in surviving animals.³

Proliferative ileitis (syn. wet tail) is caused by *Lawsonia intracellularis*, a gram-negative intracellular bacterial organism. Clinical signs include watery diarrhea, matting of the fur on the tail, hunched stance, irritability, dehydration, and emaciation. This disease predominately affects young hamsters and stress, improper diet, change of diet, or overcrowding are predisposing factors. The prognosis is guarded. Treat with antibiotics effective against intracellular organisms (e.g. enrofloxacin, doxycycline) Provide supportive care in form of nutritional support and subcutaneous fluids, if indicated.

Cheek pouch prolapse

Cheek pouch prolapse occurs secondary to impaction or infection of the cheek pouches. Animals' will chew the prolapsed tissue, and cause further traumatization. Depending on the duration of the prolapse, the tissue may be necrotic upon presentation.

Under general anesthesia the viability of the prolapsed cheek pouch tissue should be assessed and the presence of an underlying disease (e.g. impaction, infection) should be investigated.

If the prolapsed tissue is still viable, repositioning can be performed using a cotton-tipped applicator. A non-absorbable percutaneous suture is placed to keep the cheek pouch in its anatomically correct position. The suture is removed in 10-14 days. Suture placement does not always prevent recurrence of prolapse. Re-prolapse is common. If the tissue is non-viable or the risk for recurrence of the cheek pouch prolapse is high, or the pouch has re-prolapsed, perform amputation of the cheek pouch. Administer meloxicam (0.3-0.5mg/kg SC, PO q24h). Administer antibiotics if infection of the cheek pouch was diagnosed. Ensure good coverage against anaerobic bacteria (e.g. doxycycline, metronidazole). Provide supportive care, if indicated.

Bacterial pneumonia

Bacterial pneumonia in hamsters may be caused by *Pasteurella pneumotropica*, *Streptococcus pneumoniae*, or other *Streptococcus* spp. The clinical signs are depression, anorexia, oculonasal discharge, and respiratory distress. Treatment includes the administration of systemic antibiotics, fluid therapy, and nebulization.

Abdominal distension

Abdominal distension is commonly seen in geriatric hamsters and can have a variety of underlying causes. Differentials include ascites secondary to cardiac or renal insufficiency, reproductive tract disease, neoplasia, or polycystic disease, which affects mainly the liver. Large space-occupying liver cysts are not uncommon in hamsters. Under sedation or general anesthesia abdominal ultrasound should be performed to further investigate the underlying causes for abdominal distension. Free abdominal fluid should be aspirated under ultrasound guidance. Fluid aspiration may be diagnostic and therapeutic, in cases in which respiratory distress is caused by the abdominal distension. Whole body radiographs should be performed, if cardiac disease is suspected. The prognosis for abdominal distension in hamsters,

regardless of the underlying cause, is guarded to poor.

Ocular proptosis

The etiologies include trauma, molar abscessation, infection, and excessive restraint. The treatment is the same as for a dog, including a temporary tarsorrhaphy. Remove the sutures in 7–10 days. Administer broad-spectrum antibiotics. If enucleation is indicated, the subconjunctival technique should be performed and the Harderian gland should also be removed. If excessive hemorrhage occurs during enucleation, the orbit may be packed with Gelfoam®.

Cardiomyopathy

The clinical signs include dyspnea, tachypnea, cyanosis, rales, tachycardia, poor peripheral pulses, ascites, and pleural effusion. Thoracic radiographs and echocardiography are useful.

Treatment includes furosemide (2–4mg/kg IM, SC, PO q4-12h) and an ACE inhibitor. (e.g. enalapril 0.5-1mg/kg PO q24h). The prognosis is guarded.

GERBILS

- Adult average body weight = males 65–100g; females = 55–85g
- Average life span = 3–4 years
- Sexual mature with 2-3 months
- Gestation period = 24–26 days, litter size = 1–12; average is 4–6
- Weaning at 21–28 days
- Heart rate = 250–500 bpm
- Respiratory rate = 70–120 bpm
- Temperature = 98.6–102.2°F (37–39°C)

Common diseases:

Tyzzler's disease

Tyzzler's disease is an acute, often fatal, hepatoenteric disease caused by the bacterium *Clostridium piliforme*. The clinical signs include a rough hair coat, lethargy, watery diarrhea, and death. Treatment is often ineffective. Administration of doxycycline, tetracycline or metronidazole as well as supportive care can be attempted.

Salmonellosis (*S. typhimurium*, *S. enteritidis*)

The clinical signs include dehydration, diarrhea, weight loss, and sudden death. Diagnosis is by isolation of the Salmonella by bacterial culture of fecal material. Treatment is not recommended due to the zoonotic potential from the development of a carrier state in surviving animals.

Dermatitis

Underlying causes include bite wounds, (*Staphylococcus* spp. infections), ectoparasites including *Demodex*, nail abrasions, subcutaneous abscesses or neoplasia, and overcrowding. Irritation from Harderian gland porphyrins may cause alopecia and facial dermatitis. Treatment of *Demodex* and other ectoparasites is with ivermectin or selamectin.

Geriatric diseases

Common geriatric diseases in gerbils include cystic ovaries, chronic interstitial nephritis, spontaneous neoplasia, diabetes mellitus, hyperadrenocorticism, and arteriosclerosis.

Seizures

Many gerbils suffer from spontaneous epileptiform seizures, which may be a form of catalepsy. Seizures may be precipitated by stressful stimuli. The frequency of the seizures tends to decrease with age. Anticonvulsant therapy is not recommended. Keep animal in dark and quiet environment and avoid stress.¹