Introduction

Rabbits are very popular pets worldwide and many veterinarians are seeing them on a regular basis for healthy visits. There are times when they are ill and clients are seeking help. One of the more common presentations for a rabbit is gastrointestinal stasis. There are studies demonstrating that approximately 25% of all rabbit patients present for stasis. Gastrointestinal stasis has been known to veterinarians and rabbit owners as a lack of appetite and stool production. That doesn’t represent what is happening in its entirety. Routinely there are multiple areas of the gastrointestinal tract that are affected. There can be one or more of the following present: impactions of the stomach, intestines or cecum; gas accumulation of those same organs; intestinal obstruction; pancreatitis; adhesions; hepatic lipidosis; liver lobe torsion; cholangiohepatitis. Since there are many components to what has been commonly referred to as stasis, a more comprehensive name is appropriate: Rabbit Gastrointestinal Syndrome (RGIS).

Other clinical signs and examination findings may be lethargy, dehydration, abdominal distension, hunched back, and grinding teeth. Depending on the severity there can be even be significant abdominal tympani, abdominal pain, or hypovolemic shock. Underlying causes of RGIS will have their own clinical signs that will add to the problem list and require investigation.

RGIS can be compared to anemia, diarrhea, or coughing. While there are general supportive measures to manage those issues, there is always an underlying cause that starts the process. That cause may be fairly simple to identify and treat or can be quite complex. An effort to identify the initial insult or event is crucial in developing an appropriate medical and/or surgical plan and prognosis. There are times when a definitive diagnosis may not be made, but the option to investigate should be available to the client.

Development of RGIS

The rabbit gastrointestinal tract has been compared to a horse. Rabbits eat a high fiber, low energy density diet and are considered hindgut fermenters. The gut flora, primarily Bacteroides sp., helps break down the tough fibrous components in their diet, which subsequently allows the production of volatile fatty acids, a major energy source for rabbits. Since fiber promotes gastrointestinal motility, any process that alters access to fiber or decreases its proper breakdown will decrease gastrointestinal motility. That in turn can change the symbiosis
between gut flora and the intestinal tract resulting in overgrowth of pathogens like Clostridium sp.

**Etiology**

Etiology of RGIS can be categorized into categories of dietary, stress/pain, primary gastrointestinal disease, and systemic disease.

*Dietary* – Alterations in diet from the norm are a common cause of RGIS. Once the rabbit has recovered from the acute stage of disease, long term management focuses on providing a proper diet with minimal changes.

As previously mentioned rabbits eat a high fiber and low energy density diet which mainly consists of free choice quality hay, measured dark vegetables, and limited access to high fiber pellets. This particular diet separates into an easily fermentable component that gut flora helps digest for usable energy, and a slowly fermentable component that passes as a dry, firm, high fiber fecal pellet. The easily fermentable food material is eventually released as a soft fecal pellet covered in mucus, referred to as a cecotrope, and is ingested to gain the nutrients in that pellet. The high fiber promotes proper transit time of the gastrointestinal tract, as well as maintains gut flora that is responsible for proper fermentation. Any disruptions to this fine balance can lead to RGIS.

Common dietary issues leading to RGIS: low fiber diets, like minimal offering of hay or low quality pellets, rapid addition of new vegetables, non-washed or wilted vegetables, lack of transition from one hay bag to the next as hay can vary, high carbohydrate meals like fruits, treats, oats, nuts and seeds, and a lack of water.

*Stress/Pain* – Stress and pain have been shown to decrease gastrointestinal motility in rabbits. Stress can be from a single incident like fireworks or a long term situation like the addition of a new pet. Pain can be acute such as an injury to chronic issues like osteoarthritis. Manage stressors and pain as best as possible as RGIS is being treated.

*Primary Gastrointestinal Disease* – This group of diseases can be more challenging than most. Many of the clinical signs will look like RGIS and there may be a history of diet change or stress, which could lead to missing the real diagnosis. This is why it is a good idea to offer and perform diagnostics. Internal parasites, bacterial or viral enteric infections, foreign material ingestion, obstructions, and malocclusion are some of the more common gastrointestinal disorders contributing to RGIS.
Systemic Disease – Getting to the underlying cause and managing that disease will be important. Follow a logical thought process as you would for a dog or cat, but apply that process to common rabbit diseases. Many systemic diseases cause stress and pain, so manage that aspect as well as the disease itself. Chronic renal disease, neoplasia of any type, reproductive disorders, lead toxicity, and otitis media are some of the many diseases that can cause RGIS.

There are times an underlying cause to RGIS is not found, but that does not mean a detailed history and examination, along with a proper medical workup should not take place with each rabbit when possible.

Diagnosis

It is important to start with a detailed history with a strong focus on diet and any related changes. Ask about dietary indiscretion and exposure to potential toxins. Find out about other pets or have there been any significant stressors or changes in the home. A detailed history just as one would take for a dog or cat is crucial. Many times the answer can be found in the history, but do not stop there.

Radiographs, a complete blood count (CBC), and blood chemistries are a great way to assess the extent of RGIS and determine any underlying causes. Radiographs may reveal excess gas throughout different parts of the gastrointestinal tract suggesting dysbiosis or obstruction. Hepatomegaly may be observed from cholangiohepatitis, a liver lobe torsion, or hepatic lipidosis. Blood work may demonstrate a lymphopenia from pooling into the gastrointestinal tract or heterophilia from inflammation and/or infection. Findings on the blood chemistry may reflect a process related to the liver.

Underlying, causative disease may be apparent on the radiographs or blood work as well. Further diagnostics will follow any abnormal findings and should be performed if there is a poor response to therapy. Common diagnostics performed are fecal floatation, urinalysis, cytology, culture and sensitivity samples, toxicology sampling like blood lead levels, ultrasound, and CT imaging to identify additional disease processes to RGIS.

Treatment

Treatment of RGIS focuses on four main areas: fluid therapy, nutritional support, pain relief/promotility medication, and management of any underlying diseases or causes.

Fluid Therapy – Fluid therapy will depend on the clinical picture and hydration deficits. The main ways to deliver fluids are PO, SC, IV, or IO with increasing severity of dehydration.
respectively. You may use PO fluids if you do not suspect obstructive disease. IV access can be gained through the cephalic or lateral saphenous veins and IO works best in the femur or tibia.

The fluid deficit (L) = (Estimated percentage of dehydration) × kg × 1000ml/L. That amount is added to maintenance fluid requirements (3-4ml/kg/hr), plus any losses that are occurring.

Using crystalloids is most common, but colloids and blood products may be needed.

**Nutritional Support** – Nutritional support should be instituted as soon as possible to promote motility and prevent hepatic lipidosis. An additional benefit of syringe or tube feeding herbivore diets is that they contain a significant amount of water, which will help with fluid support as well.

Options for nutritional support include feeding the regular diet, administering an herbivore enteral diet by syringe, and feeding the enteral diet by nasogastric tube. A contraindication for using herbivore diets is if the patient has severe fluid deficits. Improve hydration before syringe feeding so as not to put food in a non-functional stomach. Also, if you suspect a full or partial obstruction or the stomach is significantly distended with material, hold on administering syringed herbivore diet.

**Pain Relief/Promotility Medication** – Pain and a non-motile gastrointestinal tract exacerbate each other to complicate RGIS. Using lidocaine intravenously will help with both pain, motility, and has protective effects against toxemia. A loading dose of lidocaine at 2mg/kg is given IV and then a maintenance dose of 50-100mg/kg/hrIV is administered by syringe pump. Other medications used for only pain relief are buprenorphine, hydromorphone, fentanyl, and meloxicam. Motility enhancers like metoclopramide and cisapride are routinely used, but may not have any real effects on the rabbit gastrointestinal system. Caution should be used with any prokinetic if an obstruction is being considered as a diagnosis.

**Underlying Disease** – Treat as indicated for the specific disease syndrome.

**Prognosis**

This will depend on the underlying cause of RGIS and response to therapy. In addition, it has been demonstrated that hypothermia in rabbits is a prognostic indicator. In one study a body temperature of 99°F or lower was strongly associated with a three times higher death rate than those rabbits that were euthermic. With each drop of 1.8°F from 99°F, the death rate doubled.

Diagnosis of underlying causes and instituting treatment will lead to better outcomes for those rabbits with RGIS. Treating RGIS as a symptom and not a primary disease is the goal for improved care for our rabbit patients.
References


