Therapy of GI Diseases:
What's New with Antiemetics, Antacids, and Probiotics

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Many drugs are available to treat the clinical signs associated with GI diseases or to treat the disease process itself. A though knowledge of these drugs, including several of the newer developments, is necessary for the practitioner to effectively treat dogs and cats with GI diseases.

Antiemetics

Antiemetics are effective in reducing the frequency of vomiting or in some cases completely eliminating it. In the outpatient it relieves a very objectionable clinical sign for the owner. In the hospitalized patient it reduces the severity of dehydration and electrolyte changes and allows the animal to rest. Antiemetics should be used cautiously, as continued vomiting is an important sign that the underlying condition may be progressing or that an incorrect diagnosis has been made. Masking this important parameter may give the clinician a false sense of security that the animal is improving, when actually heightened surveillance and therapy is indicated. The author is most comfortable prescribing antiemetics when a definitive diagnosis has been reached or when used for only a brief period in animals with self-limiting vomiting.

Metoclopramide

Metoclopramide (Reglan) is a highly effective antiemetic with both central and peripheral effects. Metoclopramide is a dopamine antagonist that very effectively blocks the CRTZ and raises the threshold of the vomiting center. Peripherally it augments acetylcholine release from postganglionic nerves and increases the tone and amplitude of gastric contractions and increases gastroesophageal sphincter pressure. These actions oppose some of the physical events necessary for the vomiting reflex to occur. Short term side effects are uncommon and include depression, nervousness, and restlessness. Metoclopramide is contraindicated in intestinal obstructions. Dosages of 0.2-0.4 mg/kg TID SQ are often effective. Because it has a short half life it may need to be administered by constant infusion 1.0-2.0 mg/kg/day IV.

Metoclopramide can also be used to treat esophagitis. Increasing tone of the GES helps to reduce the reflux of acid which would impede healing of the esophageal mucosa. Increasing gastric motility and emptying will help to move acid and ingesta out of the stomach into the duodenum, reducing the amount available to reflux into the esophagus. Metoclopramide's prokinetic effects are useful in treating gastric motility disorders, a group of under diagnosed conditions causing chronic vomiting (see article on gastric motility disorders.

Ondansetron

Ondansetron (Zofran) is a serotonergic antagonist that is very effective in blocking the nausea and vomiting associated with chemotherapy. It is effective in blocking neural transmission in both the chemoreceptor trigger zone and in vagal afferent pathways. Dosages of 0.5-1.0 mg/kg PO can be given 30 minutes prior to administration of chemotherapy. It can also be used to reduce vomiting associated with GI disorders at 0.1-0.15 mg/kg slow IV BID-QID. The author has not found it necessary to use the drug in this manner, although others have found it very effective. Presently, the drug is very expensive.

Maropitant – cerenia ™

Maropitant is a neurokinin receptor antagonist that blocks the actions of substance P in the central nervous system. It was released in the summer of 2007. It is approved for the prevention and or treatment of acute vomiting (dogs and cats) and motion sickness (dogs) > 8 weeks of age. Dosage for motion sickness is 8 mg/kg PO q 24H. Dosage for acute vomiting is 1 mg/kg SC q 24 H for up to 5 days. The drug is metabolized via hepatic P450 enzymes. It is considered a safe drug and side effects were similar to placebo. It was more effective than metoclopramide in a European clinical study in reducing vomiting in a large number of dogs with a variety of common causes for acute vomiting. It has also been shown to reduce vomiting associated with cisplatin administration in dogs with neoplasia.

Erosion and ulcer therapy

Erosion and ulceration of the gastric and duodenal mucosa commonly occur in chronic gastritis and gastric-duodenal ulcer disease. Back-diffusion of acid across a damaged mucosa leads to further damage and retards healing processes. Reduction of gastric acid secretion, protection of ulcerated mucosa, or augmentation of cytoprotection promotes healing of erosions and ulcers.

H-2 receptor blockade

Drugs such as cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepsid), and nizatidine (Axid) block the H-2 receptor on the gastric parietal cell and dramatically decrease acid production. Cimetidine (5-10 mg/kg QID) and ranitidine (2 mg/kg BID-TID) have been used most commonly in veterinary medicine. Both can be given orally or parenterally and have not been commonly associated with adverse effects. Cimetidine can inhibit hepatic cytochrome P-450 enzymes, potentially interfering with the metabolism of other

drugs. Famotidine, 0.5 mg/kg SID-BID, and nizatidine, 5 mg/kg SID (this dosage has not been well established), have not been used as frequently in veterinary medicine, but are also effective. All four of these drugs are now available over the counter in smaller dosage forms than prescription strength, making treatment of cats and small dogs easier. Elixirs are available for cimetidine, ranitidine, and famotidine.

Sucralfate

Sucralfate (Carafate) is a sulfated disaccharide that forms an adherent gel and binds to an ulcer crater, protecting it from acid and pepsin. It also stimulates the synthesis of prostaglandin, increases mucosal cytoprotection, and binds epithelial growth factor at the ulcer, where it stimulates cellular proliferation. It has been shown to be as effective as H-2 receptor blockers in healing ulcers in humans. Because sucralfate can bind other drugs, medications should be given 1-2 hours prior to sucralfate administration. The recommended dose is 1 gm/25 kg TID-QID in dogs and 0.25 gm TID in cats. Because absorption is minimal, toxicity is uncommon. Long-term use may lead to constipation because of its aluminum content. There is no evidence to support that combination therapy with an H-2 receptor antagonist provides added benefit compared to therapy with either sucralfate or an H-2 blocker alone.

Sucralfate is also effective to treat esophagitis because of its ability to coat ulcerated mucosa. The suspension form is necessary for this indication.

Proton pump inhibitors (PPI's)

PPI's inhibit the action of the proton pump at the apical portion of the parietal cell that exchanges H+ for luminal K+, thus preventing secretion of acid. As a weak base they accumulate in the acid compartment of the parietal cell, necessitating only SID administration. Omeprazole (Prilosec) is the most commonly used PPI in veterinary medicine. The recommended dose is 1.0 mg/kg SID. The enteric-coated granules (20 mg) are packaged in gelatin capsules to resist degradation by gastric acid. If less than one capsule is to be administered (20 mg), the granules should be repackaged in gelatin capsules. Zegerid is an omeprazole powder that is mixed with bicarbonate to protect the drug from gastric acid. It can be divided into smaller doses. Another PPI, lansoprazole (Prevacid) granules can be mixed in an acid juice, such as apple juice and administered. Other PPI's such as pantoprazole (Protonix), rabeprazole (Aciphex), esomeprazole (Nexium) must be reformulated into a form that protects the drug from gastric acid damage. Omeprazole also inhibits hepatic p-450 enzymes. Several recent studies have shown that PPI's in dogs are better at inhibiting acid secretion than H2 blockers. In humans H2 blockers begin to suppress acid faster than PPI's. Many clinicians will concurrently use an H2 blocker for 2-3 days when starting PPI therapy. Also in humans, PPI's result in faster ulcer healing and relieve clinical signs sooner than H2 blockers. These effects are not proven in dogs or cats.

Probiotics

Probiotics are live bacteria that confer a health benefit to the host. Common bacteria include lactobacilli, bifidobacteria, and enterococci. In humans a daily dose is often 5-10 million. To be effective viability must be maintained throughout production, storage, distribution, passage through the upper GI tract into the colon. Many commercially available products do not survive transit into the colon and are not as effective as "advertised". The bacteria should be able to be cultured from the feces during treatment, but will usually disappear once oral administration ends. The bacteria must be nonpathogenic and not transmit antibiotic resistance.

Probiotic bacteria have been reported to have many beneficial effects on the host including conditioning the immune system, synthesizing B vitamins, producing digestive enzymes, producing antibacterial factors, competing with pathogens for adhesion sites and nutrients, enhancing epithelial repair, increasing mucus production, decreasing luminal pH, and protecting tight junctions. However, all probiotics do not do all of the above. In humans some probiotics have been shown to be beneficial in acute infectious diarrhea, prevention of antibiotic associated diarrhea, pouchitis, cow's milk allergy, IBD, and irritable bowel syndrome. Currently there is accumulating but weak evidence demonstrating benefits of probiotics in dogs and cats with diarrhea.

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