Gastrointestinal Endocrine Disease

**TREATMENT**

**THERAPEUTIC GOAL(S)**
- Provide supportive therapy until gastrointestinal (GI) tract returns to normal.
- Remove underlying cause if known.

**ACUTE GENERAL TREATMENT**
- Nothing by mouth (NPO) for 12 to 48 hours.
- Frequent small quantities of oral fluids may be offered if vomiting is infrequent.
- Subcutaneous crystalloids may be used for animals with mild dehydration deficits.
- Intravenous fluids are required if patient is moderately or severely dehydrated or has any evidence of hypovolemia.
- After vomiting has ceased for 12 hours, offer small amounts of water or ice cubes.

**PREVENTIVE CARE**
- Initial diet should be easily digestible starch, low protein, and low fat (such as rice with cottage cheese or boiled chicken).

**COMMENTS**
- Acid blockers (H2 blockers: famotidine 8–12h or phenothiazine [0.1–0.5 mg/kg SC q 8–12h] or metoclopramide (0.2–0.4 mg/kg SC q 8–12h) derivatives (chlorpromazine, prochlorperazine) are good first choices if needed.
- Protectants/absorbatns: bismuth subsalicylate (1 ml/4 kg PO up to q 4–6h), kaolin-pectin, activated charcoal and aluminum, magnesium, or barium-containing products are often used for coating GI mucosa and binding bacteria and their toxins.
- Anticholinergics (e.g., atropine, propantheline) are not recommended.
- Antibiotics are not indicated unless there is evidence of a bacterial cause or breach of GI mucosal integrity (hematemesis or melena).

**DRUG INTERACTIONS**
- High-dose phenothiazine derivative antemetics (e.g., chlorpromazine, prochlorperazine) can cause or exacerbate hypotension, especially in dehydrated or hypovolemic patients.
- Bismuth subsalicylate should be used cautiously, especially in cats, due to generation of salicylate (aspirin) in intestine.
- Bismuth subsalicylate will normally cause stool to turn black in color, which can be mistaken for melena.

**RECOMMENDED MONITORING**
- Vital parameters.
- Frequency, volume, and character of diarrhea and vomiting.

**PROGNOSIS AND OUTCOME**
- Prognosis is excellent, usually resolves 24 to 48 hours after onset of signs.

**PEARLS & CONSIDERATIONS**
- If vomiting is not frequent, foregoing antemetics allows better assessment of response to supportive therapy. If no response occurs within 1 to 2 days, other differentials should be investigated.
- Animals with marked dehydration or hypovolemia at presentation should have more detailed diagnostic evaluation; acute nonspecific gastroenteritis rarely produces severe systemic signs.

**SUGGESTED READING**

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DISEASES AND DISORDERS

- Neoplasia of these cells results in excess secretion of the hormone(s).
- Clinical signs occur as a result of the specific hormone oversecretion.

DIAGNOSIS

DIFFERENTIAL DIAGNOSIS

See vomiting (p XXX), weight loss (p XXX), anorexia/id syndrome (p XXXX), diarrhea (p XXX), acute abdomen (p XXX), ulcerative dermatitis (p XXX), hepatocutaneous syndrome? (p XXX).

INITIAL DATABASE

- The diagnosis is made based on appropriate clinical signs and immunohistochemical staining of the tumor
- A complete blood count, serum biochemical profile, and urinalysis should be evaluated to help rule out other diagnoses.
  - Mild hyperglycemia, increased liver enzymes, hypoalbuminemia, and possible glucosuria may be seen with glucagonoma.
  - A regenerative or iron-deficiency anemia, possible leukocytosis, hypoproteinemia, and increased liver enzymes may be seen with gastrinoma.
  - Results are usually normal with carcioid syndrome.
  - Radiographs and ultrasound results are usually normal but may help identify the primary tumor or metastatic lesions.

ADVANCED OR CONFIRMATORY TESTING

- Glucagonoma: Increased plasma glucagon concentrations (in the absence of other diseases causing hyperglucagonemia), histopathology of skin lesions, and hypoaminoacidemia are supportive. Results of liver function tests are normal (versus abnormal function with hepatocutaneous syndrome).
- Gastrinoma: Increased fasting serum gastrin concentration (in the absence of other diseases causing hypergastrinemia) and gastric hyperacidity; GI ulceration and/or increased gastric rugal folds seen with endoscopy or contrast radiography; and excessive response to a gastrin-secretagogue (secretin or calcium) are supportive.
- Carcinoid syndrome: Increased serotonin metabolites (5-hydroxyindoleacetic acid) in urine are supportive.
- Confimation requires immunohistochemical staining of the tumor.

TREATMENT

THERAPEUTIC GOAL(S)

- Removal of tumor.
- Management of associated clinical signs.

ACUTE GENERAL TREATMENT

- Fluid and electrolyte abnormalities should be corrected if present.
- Gastrinoma: treat hyperacidity and GI ulceration (see Gastric Ulcer, p XXX).
- Surgical removal of the primary tumor and any visible metastasis, if possible. With gastrinoma, ulcer excision may also be needed.
- If the pancreas is manipulated during surgery, treat postoperatively for pancreatitis (see Pancreatitis, p XXX).

CHRONIC TREATMENT

- Because of the high incidence of metastasis at the time of diagnosis, surgery is not often curative and subsequent medical management is needed.
- Gastrinoma: treat hyperacidity and GI ulcerations (see above); somatostatin analog treatment (octreotide: 2 µg/kg SQ q 12h up to 10–20 µg/kg subcutaneously [SQ] q 8h) can be tried.
- Glucagonoma: amino acid supplementation (eggs, prescription diets, possible IV amino acid infusion) has been suggested but is unproven; manage skin lesions (see Hepatocutaneous Syndrome, p XXX, Ulcerative Dermatitis, p XXXX).
- Carcinoid syndrome: Increased serotonin metabolites (5-hydroxyindoleacetic acid) in urine are supportive.
- Confimation requires immunohistochemical staining of the tumor.

POSSIBLE COMPLICATIONS

The most common postoperative complication is pancreatitis in dogs.

RECOMMENDED MONITORING

Monitor recurrence of clinical signs.

PROGNOSIS AND OUTCOME

- Glucagonoma: poor if concurrent advanced liver disease (mean 5 months) or metastasis.
- Gastrinoma: poor if concurrent advanced liver disease (mean 5 months) or metastasis.
- Carcinoid syndrome: Many are asymptomatic and are found postmortem. Prognosis is guarded if metastatic disease is present.

PEARLS & CONSIDERATIONS

COMMENTS

These are complex tumors and very difficult to diagnose; referral to a specialist center is advised.

SUGGESTED READING


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