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Lecture title: Principles of Alimentary Tract Dysfunction

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Summary: **Principles of Alimentary Tract Dysfunction**

1. The primary functions of the alimentary tract are the **prehension**, **digestion** and **absorption** of food and water, and the **maintenance** of the internal environment by modification of the amount and nature of the materials absorbed.

2. The primary functions can be divided into four major modes and, correspondingly, there are four major modes of alimentary dysfunction There may be abnormality of **motility, secretion, digestion, or absorption**.

A. Motor function

1. The form and function of the small intestine of farm animals are similar between species, but the stomachs and large intestines vary considerably.

2. The motility patterns in both the small and large intestine are similar among the species.

3. In the small intestine, the fundamental unit of electrical activity is the slow wave.

4. Abnormalities of stomach and intestinal motility represent the most common consequence of gastrointestinal tract disease.

Disruption in gastrointestinal tract motility can result in the following:

a) Hypermotility or hypomotility

The most important functions of alimentary tract motility are:

1- the peristaltic movements that move ingesta from the esophagus to the rectum

2- the segmentation movements that churn and mix the ingesta, and the tone of the sphincters.

b) Distension of segments of the tract

I. Distension causes pain and, reflexively, increased spasm and motility of adjoining gut segments.

II. Distension also stimulates further secretion of fluid into the lumen of the intestine, and this exaggerates the distension.

III. When the distension passes a critical point, the ability of the musculature of the wall to respond diminishes, the initial pain disappears, and a state of paralytic ileus develops in which much muscle tone is lost.

c) Abdominal pain

I. Visceral pain can arise in any abdominal viscus or organ,

II. The mode of its development is always the same, and alimentary tract disease is the major cause of visceral and, more specifically, of abdominal pain.

III. The most important mechanism is stretching of the wall of the viscus, which stimulates free pain endings of the autonomic nerves in the wall

d) Dehydration and shock

I. An immediate effect of distension of the stomach or small intestine by the accumulation of saliva and normal gastric and intestinal secretions is the stimulation of further secretion of fluid and electrolytes into the oral segments.

II. The stimulation is self-perpetuating, and creates a vicious cycle resulting in loss of fluid and electrolytes to the point where fatal dehydration can occur.

III. The dehydration accompanied by acidosis or alkalosis, depending on whether the obstruction is in the intestine, accompanied by loss of alkali, or in the stomach, and accompanied by a large loss of acid radicals.

B. Secretory Function:

1. Diseases caused by abnormalities of secretion of digestive enzymes are not generally recognized in farm animals.

2. In humans, and to a lesser extent in small animals, defects of gastric and pancreatic secretion produce syndromes that are readily recognized, but they depend on clinical pathologic examination for diagnosis.

3. A deficiency of lactase activity has been suspected in foals affected with diarrhea of undetermined origin when the definitive diagnosis has not been made.

C. Digestive Function:

1. The ability of the alimentary tract to digest food depends on its motor and secretory functions and, in herbivores, on the activity of the microflora that inhabits the forestomachs of ruminants or cecum and colon of Equidae.

2. The flora of the forestomachs of ruminants is capable of digesting cellulose, of fermenting the end products of other carbohydrates to volatile fatty acids, and of converting nitrogenous substances to ammonia and protein

3. In a number of circumstances, the activity of the flora can be modified so that digestion is abnormal or ceases.

4. Failure to provide the correct diet, prolonged starvation or inappetence, and hyperacidity such as occurs in engorgement on grain all result in impairment of microbial digestion.

5. The bacteria, yeasts, and protozoa may also be adversely affected by the oral administration of antibiotic and sulfonamide drugs or drugs that drastically alter the pH of the rumen content.

D. Absorptive Function:

1. Absorption of fluids and the dissolved end products of digestion can be adversely affected by increased motility or by disease of the intestinal mucosa.

2. In most instances, the two occur together but occasionally, as with some helminth infestations, lesions occur in the intestinal wall without accompanying changes in motility.

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References:

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