Digestive System

Review physiology of the digestive system

Organs and some associated disorders:

- Oral cavity- inflammation-stomatitis
  Esophagus-GERD
- Stomach—peptic ulcers, gastritis
- Small intestine—malabsorption, Inflammatory bowel
- Large intestine—diarrhea, constipation
- Pancreas—pancreatitis, Diabetes, ARDS ،
- Gallbladder—cholestasis,cholelithiasis, cholecystitis
- Liver—hepatitis, cirrhosis

Cell protective mechanisms in stomach

Secretion of mucus and bicarbonate

- Dilution of gastric acid by food and secretions

- Prevention of diffusion of HCL from the stomach lumen back into the gastric mucosal lining
- Presence of prostaglandin E
- Alkalinization of gastric secretions by pancreatic juices and bile
- Stimulation (acetylcholine , gastrin, histamine)
- Inhibition(PGE2 , PGI2)

Drug act on digestive system

1: antacids
2: digestants and gastric enzyme
3: anti cholinergic
4: laxative
5: anti diarrhea

1: antacids

PH falling or Antacids :- chemically neutralize gastric acid that appear with ⇩Hcl and ⇧pepsin secretion

- pepsin is only active at very low pH, thus neutralization of pH secondarily inactivates pepsin

"Benign chronic gastric ulcer: note sharp margins, flat relatively clean ulcer base and folds that radiate from the ulcer margin, location on the lesser curvature in the antrum at the fund pyloric junction mucosa

Action :-

1: neutralizing acidity by reaction and PH ⇧ to 4-5 . (Na- bicarbonate)

2: by bifurcation (Mg - trisilicate)

3: by reaction and buffer (Al - hydroxide)

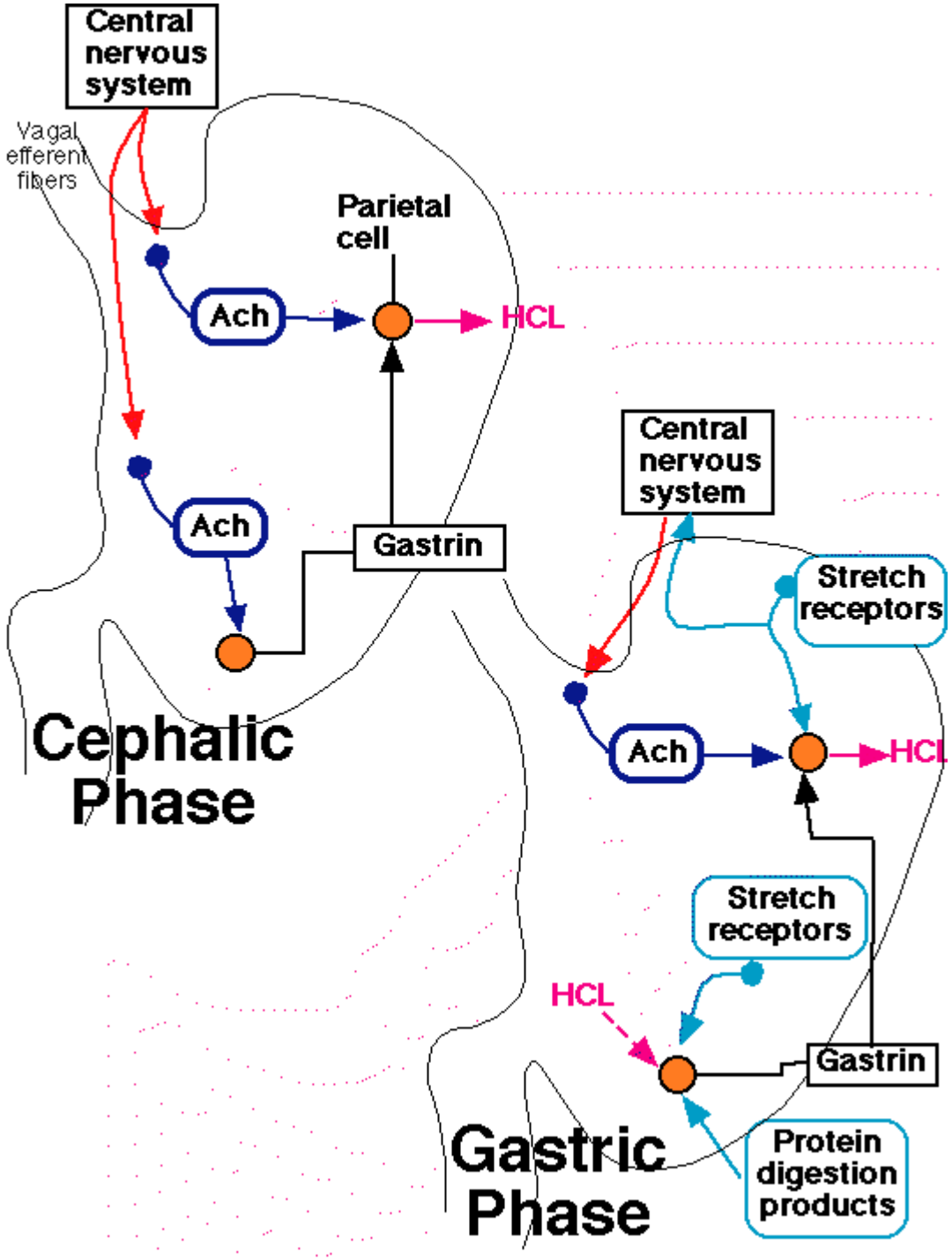
It can also classify in to :- 1. systemic A 2. local A

Drug forms

1: Simple anti acids:- give orally , suspension , tablet , powder
e.g. Aludin (Aldrox) ^{R}
2: Compound antacids (more than one antacids

e.g. gastrobel powder

Actenorum powder



Side effect of anti acids

1: long or high dose of Na – bicarbonate& Aluminum hydroxide ⟹ constipation

and the first one cause milk-alkali syndrome with elevation of serum calcium& Creatinine.

high dose of Mg – trisilicate ⟹ diarrhea

high dose of Ca – carbonate ⟹ hyper Ca

2: not give for patient complaining with renal disease (due to toxicity and hyper magnesmea and may result in renal calcinosis)

Drug Treatment

- Patients with documented duodenal ulcers (upper GI contrast radiography or endoscopy) -- treat for H. pylori)
- Many drugs, usually in combination, are used in management and eradication of H. pylori infection. Drugs include:
  - bismuth compounds
  - amoxicillin
  - tetracycline (Achromycin)
  - clarithromycin (Biaxin)
  - metronidazole (Flagyl)
  - omeprazole (Prilosec), lansoprazole (Prevacid)
  - H_2 antagonists
- Bismuth compounds
  - Mechanism of Action:
- cytoprotective effects
- compounds bind to the ulcer base, stimulating mucus and prostaglandin production
- antibacterial effect: inhibition of proteolytic, lipolytic, and unease
- Most successful protocol: triple therapy
  - bismuth compounds
  - metronidazole (Flagyl)
  - amoxicillin or tetracycline (Achromycin)
- Triple therapy (two weeks) plus H_2 blocker therapy (six weeks) is also a recommended protocol
- Further increase eradication by the addition of omeprazole
- dose of triple therapy:
  - patient compliance (two-week treatment: 200 tablets)
  - Antacids
- Most widely used: mixture of aluminum hydroxide and magnesium hydroxide (neutralizes HCl)

- H_2 Receptor Antagonists

▪ Effective inhibitor of stimulated and non-stimulated gastric acid secretion
▪ Healing rates

Cimetidine (Tagamet) -- reduces acid secretion responses to:histamine, caffeine, hypoglycemia, gastrin

Ranitidine (Zantac)-- six times as potent as cimetadine in inhibiting gastric acid secretion

Famotidine (Pepcid) and nizatidine (Axid): potent H_2 receptor blockers

Anticholinergic drugs:

atropine: not as effective as H_2 receptor blockers

Side effects:

*dryness of mouth

*blurred vision

*urinary retention

*cardiac arrhythmias

<u>Coating Agents:</u>

Sucralfate (Carafate)-complex polyaluminum hydroxide salt of sucrose sulfate

- highly polar antacid pH: binds to ulcer bed (granulation tissue, not to gastric or duodenal mucosa)
- decreases proton diffusion to the ulcer base

Colloidal bismuth: -- bismuth-protein coagulant

- may protect also from pepsin and acid digestion
- may inhibit pepsin activity

Prostaglandins: reduction in basal and stimulated gastric acid secretion

Omeprazole (Prilosec)and lansoprazole (Prevacid)inhibit the proton pump, effectively irreversibly -- requiring synthesis of new enzyme protein

Omeprazole and lansoprazole approved for treatment of:

- duodenal ulcer

- may be used in conjunction with triple therapy
- erosive esophagitis
- gastric acid hypersecretory states, including Zollinger-Ellison syndrome