

# Gastro intestinal system & Analgesics



Compiled by C Settley

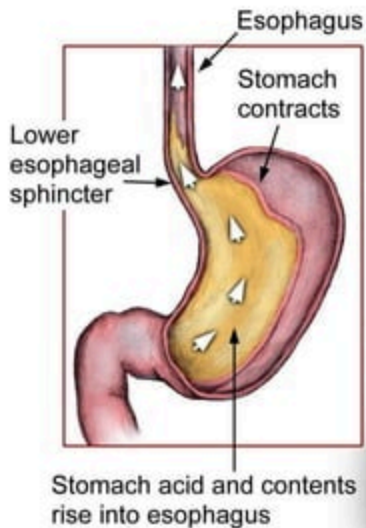
# Drugs and the gastrointestinal system

- Drugs can be used to influence the GIT to:
  - Increase gastric emptying & gastric motility
  - Balance the ratio of acid-to-mucus secretion in the stomach and neutralising gastric acid
  - Relieving diarrhoea & intestinal colic
  - Relieving constipation

# Dyspepsia, pg 152

- Dyspepsia : heartburn
- **Heartburn**, also called acid indigestion, is a symptom of gastro esophageal **reflux (GERD)**. It can occur when acid or other contents from your stomach "back up" into the esophagus. That's the tube food passes through going from your mouth to your stomach.

# Dyspepsia, pg 152



# Dyspepsia, pg 152

- Dyspepsia : heartburn
  - Simple antacids neutralise stomach acid & relieve pain
  - E.g. Magnesium containing antacids (causes diarrhoea) and aluminium containing (causes constipation).
  - Combination of these is indicated
  - NB drug interactions



# Dyspepsia, pg 152

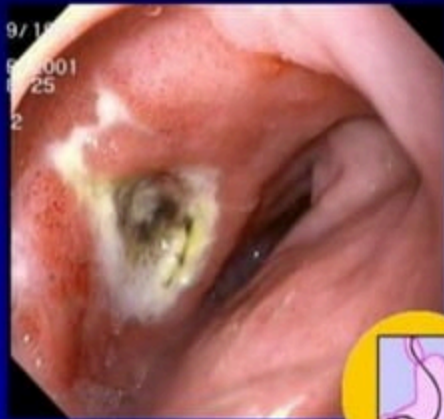
- Calcium carbonate and sodium bicarbonate may be used as simple antacids.
- However care should be taken as Calcium carbonate may interfere with normal acid base balance while sodium bicarbonate should be used with caution in patients who require a restricted sodium intake (eg ?)

## Peptic ulcer, pg 153

- Peptic ulcers are sores that develop in the lining of the stomach, lower esophagus, or small intestine (the duodenum), usually as a result of inflammation caused by the bacteria *H. pylori*, as well as from erosion from stomach acids.

# Peptic ulcer

Duodenal Ulcer (DU)



Gastric Ulcer (GU)





# Peptic ulcer

- Aim of treatment is to lower gastric acidity to allow ulcer to heal.
- Simple antacids may be used.
- Antibiotics for ulcers? Recurrent ulcers may be due to *Helicobacter pylori* infection. Treated with a combination of antibiotics.

# Peptic ulcers: Causes

- Helicobacter pylori (H. pylori): a bacteria that can cause a stomach infection and inflammation
- Frequent use of aspirin, ibuprofen, and other anti-inflammatory drugs (risk associated with this behavior increases in women and people over the age of 60)
- Smoking
- Drinking too much alcohol
- Radiation therapy
- Stomach cancer

# Peptic ulcers: Symptoms

- The most common symptom of a peptic ulcer is burning abdominal pain that extends from the navel to the chest, which can range from mild to severe. In some cases, the pain may wake you up at night. Small peptic ulcers may not produce any symptoms in the early phases.
- Other common signs of a peptic ulcer include:
  - changes in appetite
  - nausea
  - bloody or dark stools (melena)
  - unexplained weight loss
  - indigestion
  - vomiting
  - chest pain

# Peptic ulcer: treatment- Pro-kinetic drugs

- Used to treat and prevent nausea & vomiting.
- **Metoclopramide** increases the rate of gastric emptying and peristalsis.



# Peptic ulcer: treatment-

## Drugs that increase gastric pH

- Proton pump inhibitors
  - Effect: prevents secretion of HCl (gastric acid)
  - Increasing pH in stomach
  - E.g. *Omeprazole*



# Peptic ulcer: treatment-

## Drugs that reduce gastric pH

- H<sub>2</sub> receptor antagonists
  - Blocks gastric H<sub>2</sub> receptors
  - Reduces gastric acid secretion
  - Not as effective as proton pump inhibitors
  - More possible drug interactions
  - E.g. *cimetidine*

# Peptic ulcer: treatment- Cytoprotective drugs

- Protect cells of stomach lining against corrosive effects of gastric acid
- By forming a protective layer
- Very good success rate in healing of ulcers
- E.g. sucralfate
- Take one hour before meals



# Treatment for diarrhoea

## anti-motility agents

- First find cause of diarrhoea, not all diarrhoea must be stopped
- E.g. loperamide
- Non-analgesic opioid
- Stimulate opioid receptors in enteric nervous system
- To inhibit release of acetylcholine
- Decreases peristalsis



- A COMBINATION OF THESE DRUGS ARE PRESCRIBED IN THE TREATMENT OF PEPTIC ULCERS!!!

# Intestinal colic (cramps)

- E.g. Hyoscine butylbromide (Buscopan)
- Has an anti-spasmodic action



# Relieving constipation

- Laxatives should only be used to:
- Treat acute episodes of constipation
- To clean out the bowel
- To assist in elimination of drugs (overdose or poisoning) e.g. kexelate, organophosphates



# Bulk-forming laxatives

- Only bulk-forming agents for chronic use
- Indigestible substances
- Help to retain water in bowel
- Stimulates peristalsis
- Take with large glass of water
- E.g. bran

# Osmotic laxatives

- Action:
  - Increase osmotic pressure in bowel →
  - Water retained
- Mainly indicated for short term use or rapid evacuation of bowel e.g. magnesium sulphate
- *Lactulose* can be used for longer periods
- Preparation for bowel surgery? Eg ...

# Irritants / contact laxatives

- Action:
- These agents stimulate / irritate the colon directly
- Increases peristalsis
- E.g. bisacodyl, senna
- Not for chronic use, easily abused

# Other

- Stool softeners: moisten the stool by drawing water from the intestines
- Liquid paraffin: acts as intestinal lubricant

# Drug action within the central nervous system

- **Opioid analgesics**
- Action of OA's:
  - Suppress neurotransmission of pain sensations
  - Main action in brain & spinal cord (opioid receptors)
- Analgesics of choice for severe pain (examples). *Please go through drug action, indication, side effects etc*
- Morphine
- Pethidine
- Tramadol



# Pethidine

- Has a rapid onset
- Its analgesic effects are limited to a few hours in duration
- It has a toxic metabolite that accumulates with repeated administration iow not suited for the treatment of chronic pain
- Suited for post operative setting
- Obstetrics, ureter colic and biliary obstruction

## The difference between Analgesics and NSAID'S

- An anti-inflammatory drug is one that reduces inflammation or swelling.
- A pain killer, more properly called an analgesic, is a drug that stops you from feeling pain.
- Some drugs do both, such as ibuprofen. But most drugs only do one or the other.

# NSAID'S

- Anti inflammatory effects
- Antipyretic effects
- Constriction of blood vessels
  
- Examples: aspirin, diclofenac, paracetamol
  
- Read through clinical application- pg 144-145