



Gastroparesis and other upper GI problems

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Outline

- ▶ Gastroparesis
- ▶ Hiccoughs

Gastroparesis

Gastroparesis

Definition:

“A syndrome of objectively delayed gastric emptying in the absence of mechanical obstruction”

Gastroparesis

“Cardinal”* symptoms:

- ▶ Early satiety
- ▶ Postprandial fullness
- ▶ Nausea
- ▶ Vomiting
- ▶ Bloating
- ▶ Upper abdominal pain

* Symptoms seen in other upper GI conditions (e.g. gastritis, peptic ulcer)

Gastroparesis

“Cardinal” symptoms:

- ▶ Upper abdominal pain
 - intermittent / constant
 - diurnal / nocturnal
 - aggravated by eating

Gastroparesis

Aetiology:

- ▶ Idiopathic (36%) – women > men
- ▶ Diabetes mellitus (29%) – type 1 > type 2
- ▶ Post surgical (13%) – vagus nerve damage
- ▶ “Other” causes (32%)

Gastroparesis

Aetiology:

▶ “Other” causes (32%)

- viral infection
- drug treatment (e.g. opioids, anticholinergics, ciclosporine)
- neurological problems (e.g. Parkinson's disease, paraneoplastic)
- muscular problems (e.g. scleroderma, linitis plastica)
- mesenteric ischaemia

Gastroparesis

Diagnosis:

- ▶ Scintigraphy* – ^{99m}Tc sulfur colloid labelled egg sandwich
- ▶ Wireless motility capsule
- ▶ Breath testing

Gastroparesis

Pathophysiology:

- ▶ Poor correlation between symptoms and gastric motility
- ▶ [Correlation between symptoms and duodenal motility]

Gastroparesis

Management:

- ▶ Dietary measure
 - small meals
 - liquid meals
 - low fat diet
 - low fibre diet
 - avoidance carbonated drinks
 - avoidance alcohol
- ▶ [Clinically-assisted nutrition]

Gastroparesis

Management:

- ▶ Avoidance smoking
- ▶ Avoidance anti-kinetic medication
- ▶ (Diabetes mellitus – tight glucose control)

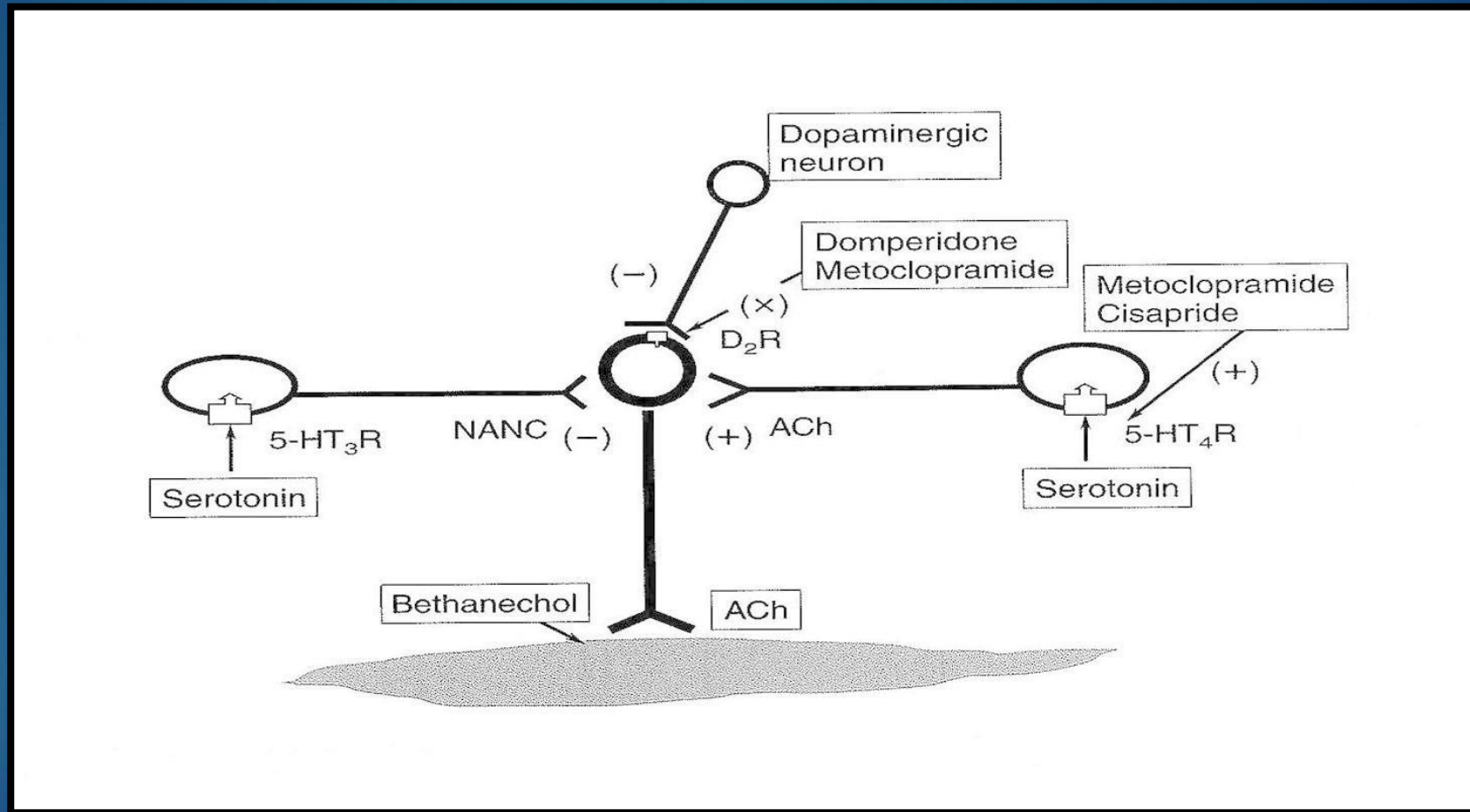
Gastroparesis

Management:

▶ Pro-kinetics

- metoclopramide*
- domperidone (lack tolerability metoclopramide)
- erythromycin (lack efficacy metoclopramide)

Gastroparesis



Gastroparesis

Metoclopramide:

- ▶ D₂ receptor antagonist
- ▶ 5HT₄ agonist
- ▶ Starting dose – 5-10mg bd-tds
- ▶ Higher dose – 10-20mg tds-qds
- ▶ [PCF5 – CSCI 100mg/24hr]
- ▶ Use lowest effective doses (dose reductions, drug holidays)
- ▶ Use liquid preparation
- ▶ Symptomatic response – 40%
- ▶ Concerns re neurological adverse effects (restrictions on use)

Gastroparesis

Domperidone:

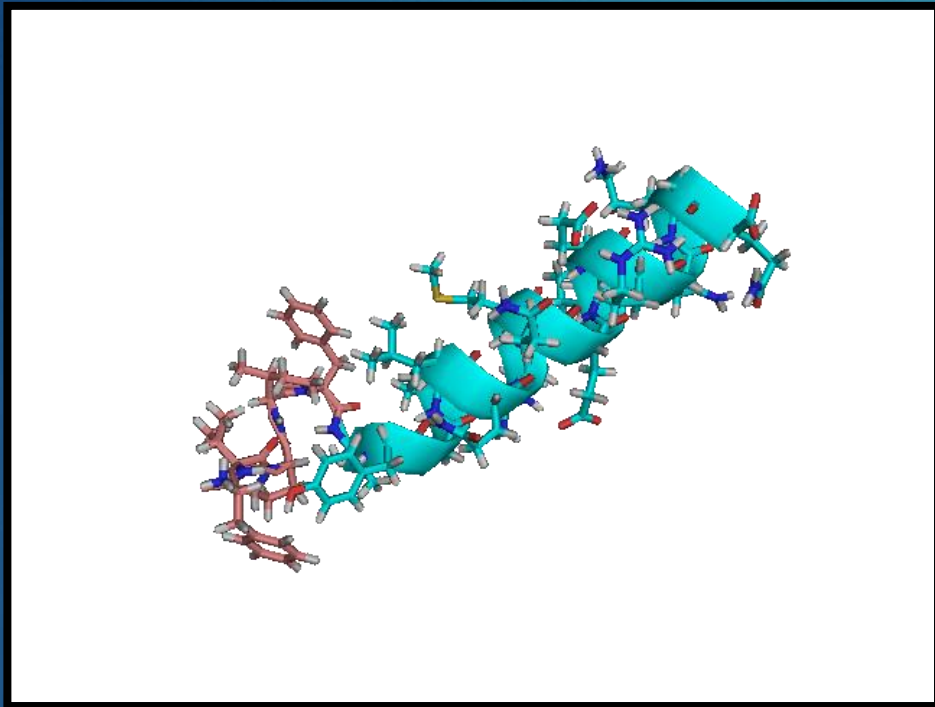
- ▶ D₂ receptor antagonist
- ▶ Usually doesn't cross blood brain barrier
- ▶ Starting dose – 10mg tds
- ▶ Higher dose – 20mg qds
- ▶ Use liquid preparation
- ▶ Symptomatic response – 50%
- ▶ Concerns re cardiovascular adverse effects (restrictions on use)

Gastroparesis

Erythromycin:

- ▶ Motilin receptor agonist
- ▶ Dose – 250-500mg tds
- ▶ Route – iv or oral (use liquid preparation)
- ▶ Symptomatic response – 50%
- ▶ Tachyphylaxis (after weeks / months)
- ▶ Drug interactions (CYP3A4)

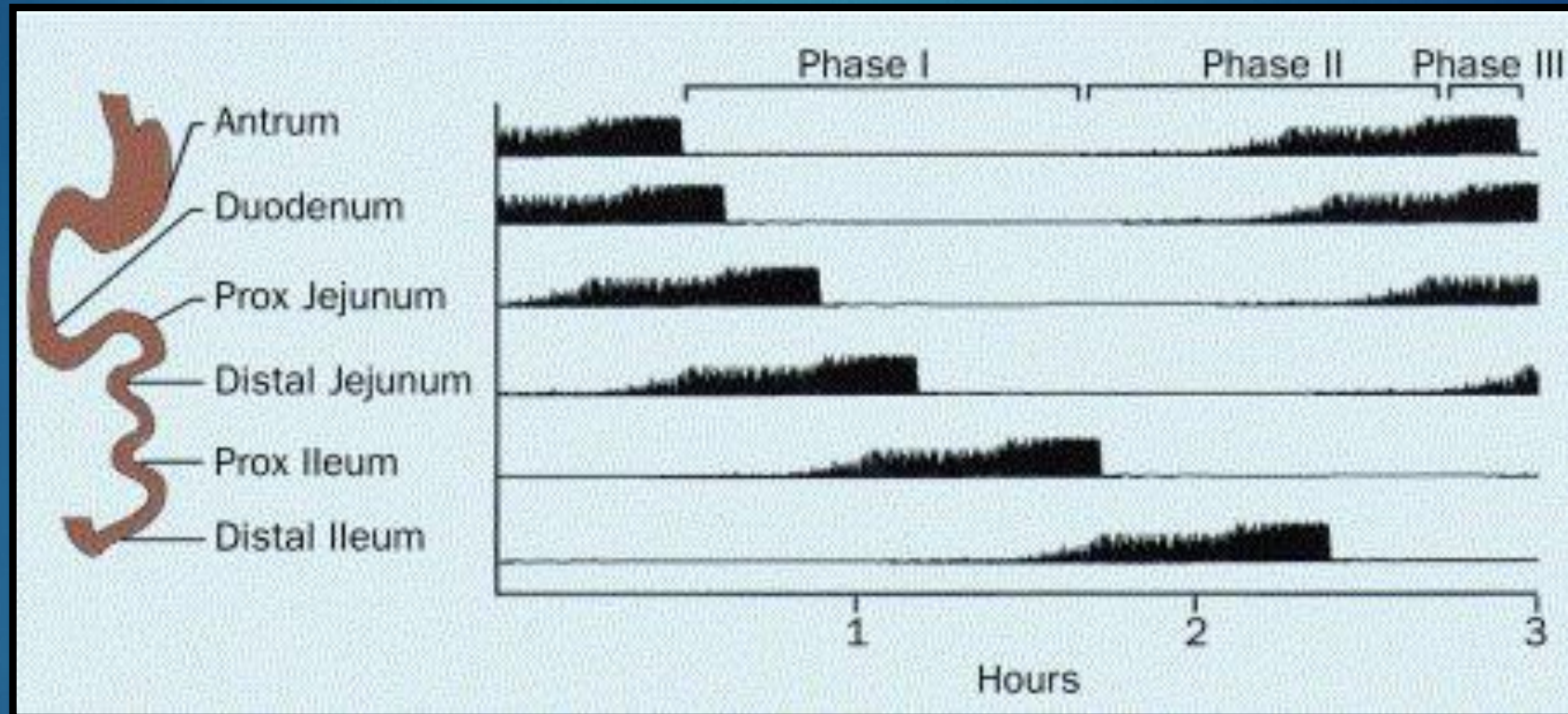
Gastroparesis



Motilin:

- ▶ Polypeptide hormone
- ▶ Secreted by endocrine M cells in small intestine
- ▶ Secreted at ~ 100 min intervals in inter-digestive period
- ▶ Increase migrating myoelectric complex (MMC)
- ▶ Predominant factor in controlling inter-digestive motility

Gastroparesis



Gastroparesis

Other anti-emetic agents*:

- ▶ Ondansetron – 5HT₃ antagonist
- ▶ Mirtazapine – 5HT₃ antagonist
- ▶ Tricyclic antidepressants

* Improve nausea & vomiting, but do not improve gastric emptying

Gastroparesis

Other prokinetic agents:

- ▶ Cholinergic agonists
 - bethanechol – M_2 agonist (gastroparesis)
 - neostigmine – anticholinesterase inhibitor (pseudo-obstruction)
- ▶ Serotonergic agonists
 - [cisapride]
 - prucalopride – $5HT_4$ agonist (constipation)
- ▶ Ghrelin agonists

Gastroparesis

Management:

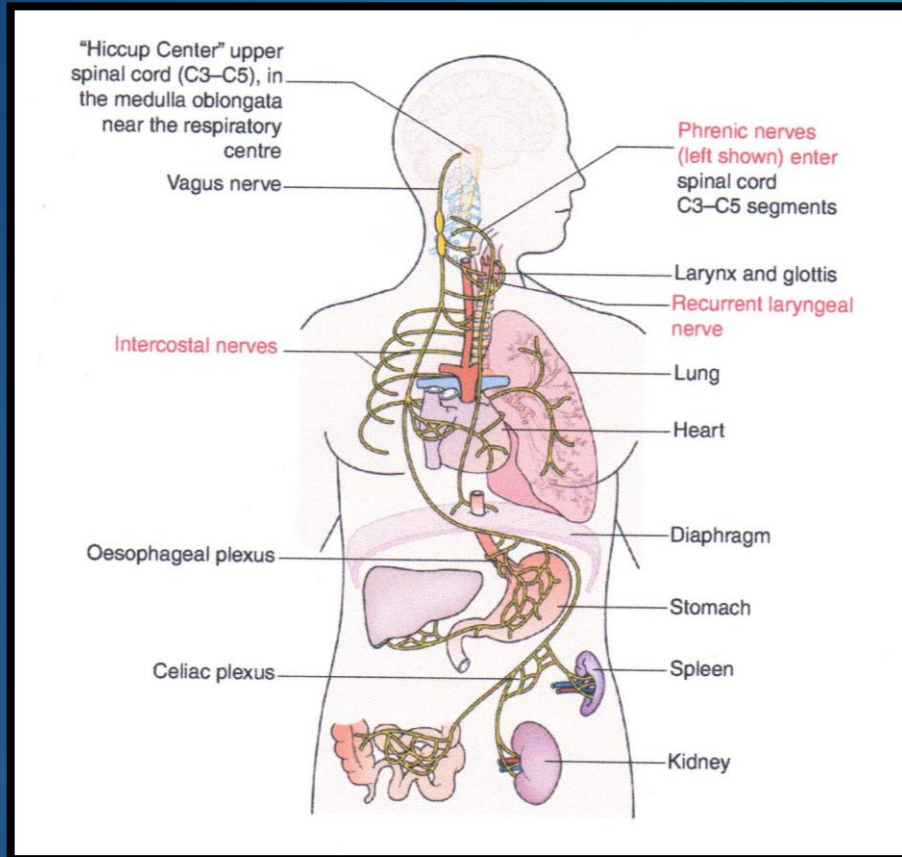
- ▶ Gastric electrical stimulation (diabetes)
- ▶ Gastrostomy
- ▶ Gastrectomy
- ▶ Pyloroplasty
- ▶ (Pyloromyotomy)
- ▶ Gastrojejunostomy
- ▶ (Gastric stent)
- ▶ Acupuncture

Hiccoughs (singultus, hiccups)

Hiccoughs

- ▶ Spontaneous, myoclonic contractions of the diaphragm and, in many cases, the intercostal musculature.
- ▶ Coordinated contraction of the inspiratory musculature leads to a sudden intake of air, which is rapidly (few milliseconds) disrupted by closure of the glottis (causing the “hic”).
- ▶ ? function of hiccoughs / hiccough reflex arc. (Hiccoughs often seen in utero)

Hiccoughs



Hiccough reflex arc

- ▶ Afferent input – vagus nerve, phrenic nerves, sympathetic nerve fibres (T6-T12)
- ▶ Hiccough centre – upper spinal cord (C3-C5), medulla oblongata, reticular formation, hypothalamus
- ▶ Efferent output – phrenic nerve, accessory nerves, recurrent laryngeal nerve of vagus nerve

Hiccoughs

Aetiology:

- ▶ > 100 potential causes
- ▶ Distension of stomach (food, drink, air)*
- ▶ Irritants to GI tract (chilli pepper)
- ▶ Irritants to respiratory tract (smoking)
- ▶ Excitement (aerophagia)
- ▶ Anxiety / fear (aerophagia)

Hiccoughs

Aetiology:

- ▶ CNS – Parkinson's disease (20%), stroke
- ▶ Peripheral nervous system (phrenic, vagus, sympathetic nerves)
- ▶ Gastrointestinal system – oesophageal cancer (25%), GORD (10%),
- ▶ Respiratory system – lung cancer, pneumonia
- ▶ Cardiovascular system – myocardial infarction, pericarditis
- ▶ ENT – pharyngitis, foreign body in ear / nose

Hiccoughs

Aetiology:

- ▶ Metabolic – hyponatraemia, hypokalaemia, hypocalcaemia, hyperglycaemia, uraemia, hypocapnia
- ▶ Medication – opioids, corticosteroids, chemotherapy (platinum compounds), dopamine agonists, antibiotics (macrolides), benzodiazepines
- ▶ Miscellaneous – alcohol, endoscopy, surgery, anaesthesia, central venous catheter

Hiccoughs

- ▶ Acute attack - < 48hr
 - children > adults
 - self limiting
- ▶ “Persistent hiccoughs”- > 2 days
- ▶ “Intractable hiccoughs” - > 1 month

Hiccoughs



Hiccoughs



Charles Osborne (1894-1991)

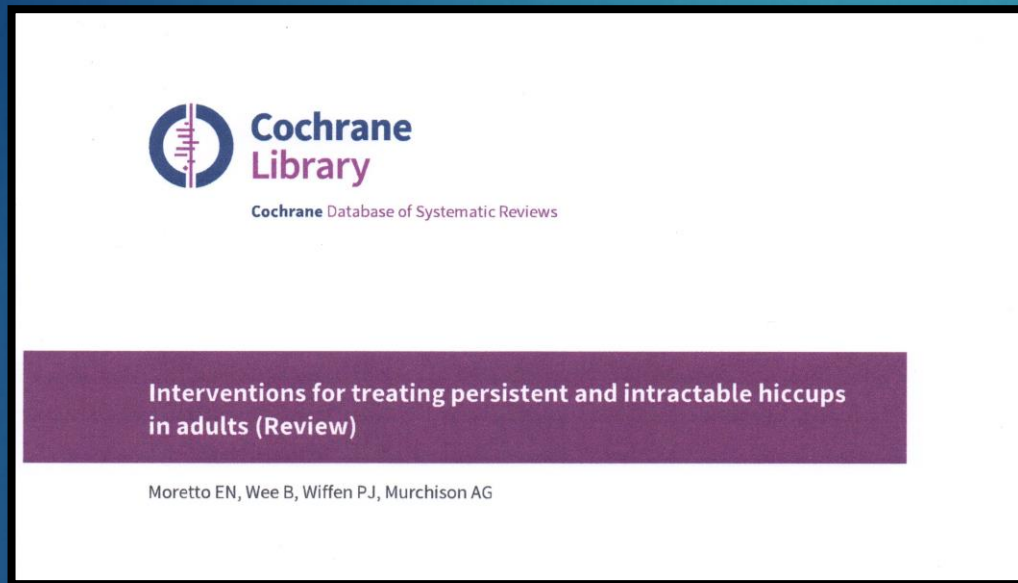
- ▶ Guinness Book of Records
- ▶ Started hiccoughing 1922
- ▶ Stopped hiccoughing 1990
- ▶ ? Intracerebral bleed
(collapsed while “hanging a 350 pound hog for butchering”)
- ▶ 20-40 hiccoughs / minute
- ▶ ~ 430 million hiccoughs / 68 yr

Hiccoughs

Management:

- ▶ Treatment of underlying cause
 - steroid rotation
- ▶ Non-pharmacological interventions
- ▶ Pharmacological interventions
- ▶ Interventional techniques
 - nerve blockade
 - nerve stimulation

Hiccoughs



“There is insufficient evidence to guide the treatment of persistent or intractable hiccups with either pharmacological or on pharmacological interventions”.

Hiccoughs



Hiccoughs

Non pharmacological methods:

- ▶ Acute attacks
- ▶ Attempt to interrupt / suppress hiccough reflex arc
- ▶ Breath holding
- ▶ Valsalva manoeuvre
- ▶ Re-breathing into paper bag

Hiccoughs

Non pharmacological interventions:

- ▶ Stimulation ENT
- ▶ Eyeball pressure
- ▶ Carotid massage
- ▶ Self-induced vomiting
- ▶ Rolling into a ball

Hiccoughs

Non pharmacological interventions:

- ▶ Hypnosis
- ▶ Acupuncture

Hiccoughs



Hiccoughs

Non pharmacological methods:

- ▶ Digital rectal massage*
- ▶ Sexual intercourse*

[“...we recommend that this kind of recommendation is reserved for carefully selected patients!”]

Hiccoughs

Pharmacological interventions:

- ▶ Persistent / intractable hiccoughs
- ▶ Multiple drugs
- ▶ (Drugs that cause hiccoughs – benzodiazepines)
- ▶ Significant “placebo” effect (spontaneous resolution)
- ▶ Targeted treatment versus empirical treatment

Hiccoughs

Pharmacological interventions:

- ▶ 1st line – baclofen [5-20 mg tds]
(gabapentin)
- ▶ 2nd line – metoclopramide [10 mg tds-qds]
(domperidone)
- ▶ 3rd line – chlorpromazine* [25-50 mg tds]

Hiccoughs

