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%)
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:
- D$_2$ receptor antagonist
- 5HT$_4$ 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:
- $D_2$ 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”.

Interventions for treating persistent and intractable hiccups in adults (Review)

Moretto EN, Wee B, Wiffen PJ, Murchison AG
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

11 Surprising Ways for Stopping Hiccups
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
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