Nausea & Vomiting

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Nausea & Vomiting

- *The Importance*
Definition

• Nausea, retching, and vomiting may occur separately or together.

• Vomiting must be differentiated from Regurgitation and Rumination
Neurologic coordination of vomiting

• the emetic center (or vomiting center) located in the medulla, specifically in the dorsal portion of the lateral reticular formation in the vicinity of the fasciculus solitarius.
Afferent neural pathways to emetic center arise from:

Are Located all over the GI tract especially:

- Pharynx
- stomach
- small intestine
- Also in Gyn., UT, testicles and the Heart
- Chemoreceptor trigger zone (CTZ)
- CNS: cortex, brainstem, and vestibular system, via the cerebellum.
Vomiting Receptors Most Relevant to Clinical Issues:

- **Stimulation of the 5-hydroxytryptamine₃ (5-HT₃) serotonin receptor:** provokes release dopamine D2 receptors in the emetic center:
  - **Ondansetron**, a 5-HT₃ receptor inhibitor;
  - **Metoclopramide**, a dopamine D2 receptor antagonist
Vomiting Receptors Most Relevant to Clinical Issues:

- Histamine H$_1$ and muscarinic M1 receptors: are abundant in the vestibular center and solitary nucleus, constitute the preferred pharmacologic targets for inhibiting motion sickness, vestibular nausea, and pregnancy-related emesis.
Vomiting Receptors Most Relevant to Clinical Issues:

- Vasopressin
- Beta-endorphin
- ACTH and is feed back with glucocorticoides
Vomiting Receptors Most Relevant to Clinical Issues:

- **Cannabinoid CB1 receptors** in the dorsal vagal complex inhibit the emetic reflex.
- Cannabinoid agonists also **modulate 5-HT\(_3\) ion channels**.
- Thus, the CB and 5-HT\(_3\) receptor systems colocalize and interact in the brainstem.
Vomiting Receptors Most Relevant to Clinical Issues:

- **Neurokinin-1 (NK-1) receptors** located in the *area postrema* and the *solitary nucleus* bind to substance *P* and are part of the terminal emetic pathways.

- **NK-1 antagonists** reduce *emesis* induced by peripherally and centrally acting emetogens.
NK-1 receptor antagonists are more efficacious than 5HT₃RI

- 5-HT₃ receptors appear to be involved to a greater extent in centrally induced emesis than in peripherally induced emesis.

- **NK-1 receptor antagonists are more efficacious than 5HT₃RI and other known antiemetic drugs in reducing vomiting induced by a variety of causes.**

- Conversely, they may have *less potent antinausea effects*. 
Paraneoplastic Syndrome

- Anti neuronal Ab:
  Such as Small Cell Carcinoma
- Metabolic products of cancers:
  Such as GI adenocarcinomas
Differential Diagnosis Of Nausea And Vomiting

• **Medications**
  – Cancer chemotherapy
    • Severe-cisplatinum, decarbazine, nitrogen mustard
    • Moderate-etopiside, methotrexate, cytarabine
    • Mild-fluorouracil, vinblastine, tamoxifene
  – Analgesics
    • Aspirin
    • Nonsteroidal antiinflammatory drugs
    • Auranofin
    • Antigout drugs
Medications

– Cardiovascular medications
  • Digoxin
  • Antiarrhythmics
  • Antihypertensives
  • $\beta$-blockers
  • Calcium channel antagonists
  • Diuretics

– Hormonal preparations
  • Oral antidiabetics
  • Oral contraceptives
Medications

– Antibiotics
  • Erythromycin
  • Tetracycline
  • Sulfonamides
  • Antituberculous drugs
  • Acyclovir

– Gastrointestinal medications
  • Sulfasalazine
  • Azathioprine
Medications

– Central nervous system active
  • Narcotics
  • Antiparkinsonian drugs
  • Anticonvulsants

– Antiasthmatics
  • Theophylline
Infectious Causes

- Gastroenteritis
  - Viral
  - Bacterial
- Nongastrointestinal infection
- Otitis media
Disorders of the Gut and Peritoneum

- Mechanical obstruction
- Gastric outlet obstruction
- Small bowel obstruction
- Superior mesenteric artery syndrome
- Functional gastrointestinal disorders
- Gastroparesis
- Chronic intestinal pseudoobstruction
- Nonulcer dyspepsia
- Irritable bowel syndrome
- Pancreatic adenocarcinoma
- Radiation therapy
- Inflammatory intraperitoneal disease
- Peptic ulcer disease
- Cholecystitis
- Pancreatitis
- Hepatitis
- Crohn’s disease
Central Nervous System Causes

- Increased intracranial pressure
- Malignancy
- Infarction
- Hemorrhage
- Abscess
- Meningitis
- Congenital malformation
- Emotional responses
- Psychiatric disease
- Psychogenic vomiting
- Anxiety disorders
- Depression
- Anorexia nervosa
- Bulimia nervosa
- Labyrinthine disorders
- Motion sickness
- Labyrinthitis
- Tumors
- Ménière disease
Endocrinologic and Metabolic Causes

- Pregnancy
- Uremia
- Diabetic ketoacidosis
- Hyperparathyroidism
- Hypoparathyroidism
- Hyperthyroidism
- Addison disease
– *Postoperative Nausea and Vomiting*

– *Cyclic Vomiting*
Miscellaneous Causes

- Cardiac disease
- Myocardial infarction
- Congestive heart failure
- Ethanol abuse
- Jamaican vomiting sickness
- Hypervitaminosis
- Starvation
Mechanical & Dynamic sequence Of Vomiting

- Gastric arrhythmia; Contractions of duodenum; Reflux of duodenal content to stomach; Retching; Contraction of gastric muscle, diaphragm and abdominal wall muscles

- Other reflex phenomena that may accompany this picture include hypersalivation, cardiac arrhythmias, and passage of gas and stool rectally.
Clinical picture may guide us to the etiology

- Acuteness
- Duration and severity
- Content of vomitus
- Fever
- Abdominal pain
- Chest pain
- Flunk pain
- Headach
- Jaundice
- Hx. Of surgery
- Irregular menses
- Drug history
- Diet hx.
- Pregnancy
- Diarrhea
- Physical Examination
- Psychological status
Morning nausea and vomiting

Produced by direct activation of the emetic center or CTZ.

- This type of emesis is most typical of pregnancy, drugs, toxins (e.g., alcohol abuse), or metabolic disorders (diabetes mellitus, uremia).
- Psychogenic vomiting also may exhibit these characteristics.
- Excessive nocturnal postnasal drip
Immediate Postprandial Vomiting

✓ Gastric or Pyloric canal ulcer
✓ Psychogenic vomiting
Late Postprandial Period Vomiting

Evacuation of retained and partially digested food indicate:

- Gastric outlet obstruction
- Gastroparesis
- Blockage
Pseudovomitus

Totally undigested food that has not been exposed to gastric juice is expelled:

- Long-standing achalasia
- Large Zenker's diverticulum
Bilious vomiting

- Multiple vomiting episodes
- Obstruction distal to D2
- Enterogastric anastomosis
Feculent Odor Vomitus

- Intestinal obstruction
- Ileus associated with peritonitis
- Long-standing gastric outlet obstruction
Abrupt Projectile Vomiting

Direct stimulation of the emetic center:

- Intracerebral lesions (tumor, abscess)
- Increased intracranial pressure
Bloody vomitus

- **Unmixed Fresh blood**: Nasopharynx, Lung, esophageal lesions, Malory Weiss tear
- **Mixed copious fresh blood**: Variceal bleeding, Malory Weiss tear, Hemorrhagic gastritis, Dieulafoy’s lesion
- **Coffee ground vomitus**: PUD, CA, Vascular anomaly
Unusual cases with nausea and vomiting
CASE 1

A 22 years old lady presented with a few months history of nausea. All evaluations were completely normal. She reported a rapid intentional weight loss (about 30 kg) by a restrict diet.

STARVATION INDUCED NAUSEA
CASE 2

• A 19 years old lady,
• Height=180 cm, BW=35 kg
• Unable to walk without help
• Her families complaint was nausea and unwillingness to eat
• She believed that she is still obese and she should decrease her weight about 5 kg more

ANOREXIA NERVOSA
CASE 3

• A 14 years old lady with 1 month history of nausea
• She had taken lots of drugs for her symptom without relief
• She also had headache

• BRAIN CT SCAN SHOWED A TUMOR
CASE 4

• A 58 lady presented with nausea and late post prandial vomiting from one month ago.
• She had also complaint of right flank and RLQ pain
• Ph. Exam: A mass was palpated in RLQ
• Multislice CT showed a 4x5 cm heterogenous mixed solid and liquid mass at or adjacent to cecum and another 2x2 cm with the same characteristics in pancreatic tail
Case 5

• A 14 year old girl presented with one month history of nausea and vomiting.
• She visited many physicians and were evaluated extensively including upper GI series. CBC, LFT, TFT, RFT and electrolytes were normal
• Beta HCG was positive. She then reported sexual contact.
Case 6

- A 13 years old lady were admitted in Alzahra emergency department with loss of consciousness.
- Her family reported that she had nausea and vomiting from one month ago and had taken many drug for this problem
- **Routine Lab tests showed**
  - BUN = 130,  Cr. = 11
Case 7

- 12 o’clock at night a wedding ceremony was taken place in a street
- Cars horning and passing the street.
- A motor cycle riding by two guys behind the crowd
- Suddenly the motorcycle driver turned his head toward the side road and did a red projectile vomit. He repeated again once more
- **Alcohol (Wine) abuse**
Case 8

• A 20 year old man reported nausea and mild epigastric discomfort one hour after having his lunch
• One hour later he vomited which contained the food materials
• One hour later he went to shock when he wanted to go to rest room
• Physical exam showed RLQ pain, tenderness, rebound tenderness and referred tenderness
• One hour later surgery was done.
• **PERFORATED APPENDICITIS**
Case 9

• A 68 year old man with past history of dyspepsia presented with nausea and epigastric discomfort aggravating with some foods.

• He didn’t want any evaluation because he thought it the old problem and need only a bottle of antacid syrup

• EKG showed Acute Inferior MI
Case 10

• A 6 year old boy admitted to ICU because of coma.
• His father reported nausea and vomiting from a few month ago and addison’s disease in his brother
• Intensive work up showed
  • Addison's crises
Case 11

• A 55 year old man with hx. Of gastric cancer 2 years ago presented with nausea and post prandial vomiting from 6 months ago.
• He had severe weight loss and food intolerance
• Evaluations for cancer relapse were negative
• Endoscopy showed stricture at the opening of ascending loop
• Ascending loop intubation was impossible
• Biopsy from the site of anastomosis were negative for malignancy.
• **Surgical repair of the site of anastomosis were done.** Complete relief of the symptoms and weight gain achieved.
Case 12

• A 32 years old nurse came with post prandial vomiting and severe weight loss.
• His problem began from a few months ago and aggravated recently.
• Severe weight loss and anxiety is seen.
• 2 Endoscopies have not shown any abnormality in upper GI.
  • reendoscopy showed a mass in distal D2
  • Laparatomy showed extensive peritoneal involvement
Thank you for your attention