Video will be taken at this clinic and potentially used in Project ECHO promotional materials. By attending this clinic, you consent to have your photo taken and allow Project ECHO to use this photo and/or video. If you don’t want your photo taken, please let us know. Thank you!

ECHO Nevada emphasizes patient privacy and asks participants to not share ANY Protected Health Information during ECHO clinics.
Gerd

- Definition of GERD
- Pathophysiology of GERD
- Clinical Manifestations
- Diagnostic Evaluation
- Treatment
- Complications
Definition of GERD

- Montreal consensus panel (44 experts):

  “a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications”

- Troublesome—patient gets to decide when reflux interferes with lifestyle

Definition

• American College of Gastroenterology (ACG)
  – Symptoms OR mucosal damage produced by the abnormal reflux of gastric contents into the esophagus
  – Often chronic and relapsing
  – May see complications of GERD in patients who lack typical symptoms
Physiologic vs Pathologic

• Physiologic GERD
  – Postprandial
  – Short lived
  – Asymptomatic
  – No nocturnal sx

• Pathologic GERD
  – Symptoms
  – Mucosal injury
  – Nocturnal sx
Lower Esophageal Sphincter

- Intrinsic distal esophageal muscles – tonically contracted
- Muscular Sling fibers of the gastric cardia
- Diaphragmatic crura
- Transmitted pressure of the abdominal cavity
Pathophysiology

• Primary barrier to gastroesophageal reflux is the lower esophageal sphincter
• LES normally works in conjunction with the diaphragm
• If barrier disrupted, acid goes from stomach to esophagus
Pathophysiology of GERD

- Impaired esophageal clearance
- Hiatal hernia
- Transient, inappropriate relaxations of LES
- Gastric acid; Pepsin secretion: normal/raised
- Pyloric incompetence; duodenogastroic reflux
- Impaired salivary function
- Impaired esophageal mucosal defense
- Reduced resting pressure of LES
- Delayed gastric emptying

Dr. K. Sendhil Kumar.
Surgical gastroenterologist
Gateway clinics & hospital
Hiatal Hernia and Reflux

LES - pressure often low
Gastric pouch - intra-thoracic reservoir
Diaphragm - no esophageal pinch
Hiatus Hernia
Symptoms of GERD

• Esophageal
  – Heartburn
  – Dysphagia
  – Odynophagia
  – Regurgitation
  – Belching

• Extraesophageal
  – Cough
  – Wheezing
  – Hoarseness
  – Sore throat
  – Globus sensation
  – Epigastric pain
  – Non-cardiac chest pain (NCCP)
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Predominance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heartburn</td>
<td>80</td>
</tr>
<tr>
<td>Regurgitation</td>
<td>54</td>
</tr>
<tr>
<td>Abdominal Pain</td>
<td>29</td>
</tr>
<tr>
<td>Cough</td>
<td>27</td>
</tr>
<tr>
<td>Dysphagia for solids</td>
<td>23</td>
</tr>
<tr>
<td>Hoarseness</td>
<td>21</td>
</tr>
<tr>
<td>Belching</td>
<td>15</td>
</tr>
<tr>
<td>Aspiration</td>
<td>14</td>
</tr>
<tr>
<td>Wheezing</td>
<td>7</td>
</tr>
<tr>
<td>Globus</td>
<td>4</td>
</tr>
</tbody>
</table>
Montreal Classification of GERD

GERD is a condition which develops when the reflux of gastric content causes troublesome symptoms or complications.

Esophageal Syndromes

1. Typical Reflux Syndrome
2. Reflux Chest Pain Syndrome

Symptomatic Syndromes

1. Reflux Esophagitis
2. Reflux Stricture
3. Barrett's Esophagus
4. Esophageal Adenocarcinoma

Syndromes with Esophageal injury

Extraesophageal Syndromes

1. Reflux Cough Syndrome
2. Reflux Laryngitis Syndrome
3. Reflux Asthma Syndrome
4. Reflux Dental Erosion Syndrome

Established Associations

1. Pharyngitis
2. Sinusitis
3. Idiopathic Pulmonary Fibrosis

Proposed Associations

1. Recurrent Otitis Media

Factors That Can Aggravate GERD

• *Diet* – Caffeine, fatty/spicy foods, chocolate, coffee, peppermint, citrus, alcohol

• *Position/Activity* – Bending, straining

• *External Pressure* – pregnancy, tight clothing
Diagnostic Evaluation

– If classic symptoms of heartburn and regurgitation exist in the absence of “alarm symptoms” the diagnosis of GERD can be made clinically and treatment can be initiated
Alarming Signs & Symptoms

- Dysphagia
- Early satiety
- GI bleeding
- Odynophagia
- Vomiting
- Weight loss
- Iron deficiency anemia
Diagnostic Tests for GERD

- Barium swallow
- Endoscopy
- Ambulatory pH monitoring
- Impedance-pH monitoring
- Esophageal manometry
Barium Swallow

• Useful first diagnostic test for patients with dysphagia
  – Stricture (location, length)
  – Mass (location, length)
  – Hiatal hernia (size, type)

• Limitations
  – Detailed mucosal exam for erosive esophagitis, Barrett’s esophagus
Endoscopy

• Indications
  – Alarm symptoms
  – Empiric therapy failure
  – Preoperative evaluation
  – Detection of Barrett’s esophagus
Esophago-gastro-duodenoscopy

• Endoscopy (with biopsy if needed)
  – In patients with alarm signs/symptoms
  – Those who fail a medication trial
  – Those who require long-term tx

• Absence of endoscopic features does not exclude a GERD diagnosis

• Allows for detection, stratification, and management of esophageal manifestations or complications of GERD
pH

• 24-hour pH monitoring-----Physiologic study

  – Accepted standard for establishing or excluding presence of GERD for those patients who do not have mucosal changes

  – Trans-nasal catheter or a wireless, capsule shaped device
Ambulatory 24 hr. pH Monitoring

Normal

GERD
Esophageal Manometry

Limited role in GERD

- Assess LES pressure, location and relaxation
  - Assist placement of 24 hr. pH catheter
- Assess peristalsis
  - Prior to antireflux surgery
Treatment

- **Goals of therapy**
  - Symptomatic relief
  - Heal esophagitis
  - Prevent & Treat complications
  - Maintain remission
Lifestyle Modifications

• Weight reduction if overweight
• Avoid clothing that is tight around the waist
• Modify diet
  – Eat more frequent but smaller meals
  – Avoid fatty/fried food, peppermint, chocolate, alcohol, carbonated beverages, coffee and tea, onions, garlic.
  – Stop smoking
• Elevate head of bed 4-6 inches
• Avoid eating within 2-3 hours of bedtime
Treatment

• Antacids
  • Quick but short-lived relief
  • Neutralize HCl acid

  – Approx 1/3 of patients with heartburn-related symptoms use at least twice weekly

  – More effective than placebo in relieving GERD symptoms
Treatment

• Histamine H2-Receptor Antagonists
  – More effective than placebo and antacids for relieving heartburn in patients with GERD
  – Faster healing of erosive esophagitis when compared with placebo
  – Can use regularly or on-demand
## Treatment

<table>
<thead>
<tr>
<th>AGENT</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cimetadine</td>
<td>400-800mg twice daily</td>
</tr>
<tr>
<td>Famotidine</td>
<td>20-40mg twice daily</td>
</tr>
<tr>
<td>Ranitidine</td>
<td>150mg twice daily</td>
</tr>
</tbody>
</table>
Collaborative Care

• Drug therapy (cont’d)

  – Prokinetic drugs
    • Promote gastric emptying
    • Reduce risk of gastric acid reflux
Treatment

• Proton Pump Inhibitors

  – Better control of symptoms with PPIs vs H2RAs and better remission rates
  – Faster healing of erosive esophagitis with PPIs vs H2RAs
## Treatment

<table>
<thead>
<tr>
<th>AGENT</th>
<th>EQUIVALENT DOSAGES</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esomeprazole</td>
<td>40mg daily</td>
<td>20-40mg daily</td>
</tr>
<tr>
<td>Omeprazole</td>
<td>20mg daily</td>
<td>20mg daily</td>
</tr>
<tr>
<td>Lansoprazole</td>
<td>30mg daily</td>
<td>15-10mg daily</td>
</tr>
<tr>
<td>Pantoprazole</td>
<td>40mg daily</td>
<td>40mg daily</td>
</tr>
<tr>
<td>Rabeprazole</td>
<td>20mg daily</td>
<td>20mg daily</td>
</tr>
</tbody>
</table>
Treatment

• H2RAs v/s PPIs

  – 12 week freedom from symptoms
    • 48% vs 77%

  – 12 week healing rate
    • 52% vs 84%

  – Speed of healing
    • 6%/wk vs 12%/wk
## Effectiveness of Medical Therapies for GERD

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifestyle modifications/antacids</td>
<td>20 %</td>
</tr>
<tr>
<td>H$_2$-receptor antagonists</td>
<td>50 %</td>
</tr>
<tr>
<td>Single-dose PPI</td>
<td>80 %</td>
</tr>
<tr>
<td>Increased-dose PPI</td>
<td>up to 100 %</td>
</tr>
</tbody>
</table>
Side effects of PPIs:

- Headache, nausea & vomiting.
- Diarrhea & Clostridium difficile colitis.
- They may cause gastric bacterial overgrowth, vitamin B12 & iron malabsorption & gastric cancer.
- Hypocalcemia (give Ca^{++} supplements as Ca^{++} citrate).
Treatment

• Antireflux surgery
  – Failed medical management
  – Patient preference
  – GERD complications
  – Medical complications attributable to a large hiatal hernia
  – Atypical symptoms with reflux documented on 24-hour pH monitoring
Treatment

• Antireflux surgery candidates
  – GERD proven esophagitis
  – Normal esophageal motility
  – Partial or complete response to acid suppression
Principles of Anti-Reflux Surgery

- Restore Intra-abdominal esophagus
- Reduce Hiatal hernia
- Approximate Diaphragmatic crurae
- Perform Fundoplication
Nissen Fundoplication

Laparoscopic
Complete vs. partial fundoplication

- Ant. partial fundoplication \(\rightarrow\) Thal/Dor procedure

- Post. partial fundoplication \(\rightarrow\) Toupet procedure
Treatment

• Postsurgery
  – 10% have solid food dysphagia
  – 2-3% have permanent symptoms
  – 7-10% have gas, bloating, diarrhea, nausea, early satiety
Treatment

• Endoscopic treatment
  – Relatively new
  – No definite indications
  – Select well-informed patients with well-documented GERD responsive to PPI therapy may benefit

• Three categories
  – Radiofrequency application to increase LES reflux barrier
  – Endoscopic sewing devices
  – Injection of a nonresorbable polymer into LES area
Complications

• Erosive esophagitis
• Stricture
• Barrett’s esophagus
• Adenocarcinoma
Refractory GERD

• Despite treatment with PPI therapy symptoms continue
• Difficult because it is a patient-driven phenomenon
• most believe that only patients with GERD who have partial or lack response to BID PPI therapy
  • they may have NERD or functional heartburn
Failure to PPI

- Timing
  - 30 mins prior to a meal
- Compliance
  - symptoms, $,insurance,pill,side effects
- Functional heartburn/Reflux hypersensitivity
  - up to 58 % don't respond to PPI BID
    - Rome IV criteria
      - burning sensation
      - absence of symptom relief
      - absence of evidence of GERD, or EoE
      - absence of motor disorder
Failure to PPI

- Bile Reflux
- Nocturnal Acid breakthrough
- Metabolism
  - metabolized by CYP2C isoenzyme
  - 3% caucasians, 10 % Asian lack
- Bioavailability
  - maybe influenced by environmental and manufacturing
- H.Pylori
  - PPI increase acid suppression
- Psychological
  - anxiety potentiates symptoms
Treatment options

• PPI BID consider changing PPI’s
• Variable results with adding H2blocker at night
• Baclofen
  • reduced TLESR rates
  • reduced reflux episodes
  • Inc. LES pressure
  • increased GE
    • concerns
      • crossed BBB
        • confusion, drowsiness weakness
Treatment options

• Esophageal hypersensitivity
  • visceral pain modulators
    • TCA, Trazadone, SSRI
• Treat
  • delayed gastric emptying (like DM)
  • Surgery (?? young patients)
• Bile binding agents, Carafate
Complications

- **Erosive esophagitis**
  - Responsible for 40-60% of GERD symptoms
  - Severity of symptoms often fail to match severity of erosive esophagitis
Complications

- Esophageal stricture
  - Result of healing of erosive esophagitis
  - May need dilation
TTS Balloon Dilation of a Peptic Stricture
Complications

• Barrett’s Esophagus
  – Columnar metaplasia of the esophagus
  – Associated with the development of adenocarcinoma
Barrett’s Esophagus
Complications

• Barrett’s Esophagus
  
  – Acid damages lining of esophagus and causes chronic esophagitis
  
  – Damaged area heals in a metaplastic process and abnormal columnar cells replace squamous cells
  
  – This specialized intestinal metaplasia can progress to dysplasia and adenocarcinoma
Complications

• Barrett’s Esophagus

  – Manage in same manner as GERD
  – EGD every 3 years in patient’s without dysplasia
  – In patients with dysplasia annual to shorter interval surveillance
Summary

• Definition of GERD
• Epidemiology of GERD
• Pathophysiology of GERD
• Clinical Manifestations
• Diagnostic Evaluation
• Treatment
• Complications