Gastro esophageal reflux disease (gerd) essay sample

Health & Medicine, Disease

It is one of the most common diseases, greatly affecting health care and contributing to the expenditure in the United States of nearly 12 billion dollars per year for antacid medications. GERD affects nearly equal proportions of men and women, but a male predominance occurs in esophagitis and Barrett’s esophagus. Increasing age is an important factor in the prevalence of GERD complications, probably the result of cumulative acid injury overtime to the esophagus.

In a nationwide population-based study by the Gallup Organization in the US, 44% of the respondents reported heartburn at least once a month. On the basis of symptoms, GERD is common in Western countries. Obesity has been associated as a contributory factor in the increase prevalence of GERD in western populations. Along with environmental factors, the epidemiology of GERD may also be attributed to genetics. The genetic mechanisms are unknown but maybe related to a smooth muscle disorder associated with hiatal hernia, reduced lower esophageal sphincter (LES) pressure and impaired esophageal motility

Etiology

Gastroesophageal reflux disease is a consequence of the failure of the normal antireflux barrier to protect against frequent and abnormal amounts of gastroesophageal reflux. It is the gastric contents moving effortlessly from the stomach to the esophagus. It is a normal physiologic process that occurs multiple times each day especially after large meals.

Possible factors determining whether reflux occurs include abdominal straining, presence of hiatal hernia and degree of esophageal shortening and duration of transient lower esophageal sphincter relaxations. Pregnancy also increases the risk of reflux by increasing intraabdominal pressure and through hormonal mechanisms. In addition, pharmacologic agents such as progesterone-containing medications (birth control pills), narcotics, benzodiazepines, calcium-channel blockers and theophylline may decrease the pressure of LES.

The relationship of H. pylori and GERD has been one of controversy. Some early studies suggested that eradication of H. pylori infection in the setting of duodenal ulcer disease would result in an increase in erosive esophagitis and GERD symptoms. Although there are several studies to support this, the weight of the evidence suggests strongly that eradication of H. pylori has no effect on the development of heartburn and in fact does not exacerbate GERD symptoms when they are present at baseline.

Symptoms/Clinical Manifestations

Most common clinical manifestations are heartburn which is a burning feeling rising from the stomach or lower chest and radiating toward the neck, throat and occasionally back, regurgitation, chest pain, dysphagia. Symptoms occur after eating large meals, or after ingesting spicy foods, citrus products, fats, chocolates, caffeine and alcohol. These symptoms are related to reflux esophagitis or inflammation of the esophagus which is due to highly acidic reflux stomach contents.

Persistent GERD causes complications which includes esophageal strictures, Barrett esophagus (columnar tissue replacing the normal squamous epithelium of the distal esophagus, which is a significant risk for esophageal cancer). Pulmonary symptoms include cough, asthma, and laryngitis which are due to reflux into the breathing passages.

Less Common Symptoms:

Water brash = sudden appearance in the mouth of a slightly sour or salty fluid Odynophagia = a severe sensation of burning, squeezing pain while swallowing caused by irritation of the esophagus burping

hiccups

nausea

vomiting

Older patients are asymptomatic due to decreased acidity of the reflux material

Complications

Esophageal Cancer

Esophageal Ulceration

Peptic Stricture

Barretts’s Esophagus = the lining of the esophagus is damaged by stomach acid and becomes like the lining of the stomach. Hemorrhagic Esophagitis

Aspiration Pneumonia

Ulcer Perforation

Health Care Impact

Rarely a cause of death

Most common digestive disease diagnosed

6 or more outpatient visits with GERD per 100 people in the US 10th most common inpatient GI diagnosis

Estimated 95, 000 discharges per year

Second most costly GI disease behind liver disease

Chronic disease which significantly impairs quality of life Comorbidities of Irritable Bowel Syndrome (IBS) and pyschological distress potentiate the negative effect on quality of life.

Methods of Diagnosis

1. Empirical Trial of Acid Suppression
2. Endoscopy
3. Esophageal Biopsy
4. Esophageal pH Monitoring
5. Barium Esophagram
6. Esophageal Manometry

Empirical Trial of Acid Suppression

The simplest and most definitive method for diagnosing GERD and assessing its relationship to symptoms. The response to antireflux therapy ensures a cause-and-effect relationship between GERD and symptoms. Proton Pump Inhibitors (PPI), have become the first test used in patients with classic of

atypical reflux symptoms. Symptoms usually respond and disappear with PPI trial in one to two weeks of treatment. If symptoms disappear with therapy and then return when the medication is discontinued, GERD has been established.

Initial dose of medication like Omprazole is 40 to 80 mg/day for at least 2 weeks. This approach has a sensitivity of 68% to 83% for determining the presence of GERD. Advantages: office base, easily done, relatively inexpensive, available to all physicians, avoids many needless procedures. Disadvantages: Includes placebo response, uncertain symptomatic endpoint if symptoms do not totally resolve with extended treatment.

Endoscopy

Upper endoscopy is the standard for documenting presence and extent of esophagitis and excluding other etiologies for the patient’s symptoms. The sensitivity of endoscopy for GERD is poor but it has excellent specificity at 90% to 95%. Advantage: Used in patients experiencing alarming symptoms of dysphagia, odynophagia, weight loss and GI bleeding. In these cases, endoscopy should be done early to diagnose complications and to rule out other entities like infections, ulcers, cancer or varices. Current guidelines about endoscopy is to diagnose and treat GERD complications. Disadvantage: Invasive, may cause rupture of internal organs, sedation is needed.

Endoscopic signs of GERD:

Edema and erythema

Friability = easy bleeding results from the development of enlarged capillaries near the mucosal surface in response to acid

Granularity

Red Streaks = extends upward from the esophageal junction along the ridges of esophageal folds

Erosions of the mucosa = begins at the gastroesophageal junction which develop with progressive acid injury

NEW DIAGNOSTIC METHOD

Esophaheal Capsule Endoscopy

11 by 26 mm capsule and acquires video images at 14 frames per second. Images are transmitted to a portable receiver via digital radio-frequency. This test has a sensitivity of 50% for erosive esophagitis, 54% for hiatal hernia and 79% for Barrett’s esophagus. Advantages: Painless, non invasive, convenient, no sedation, results available immediately, cost less than conventional endoscopy. Disadvantages: Only esophagus is evaluated and stomach and duodenum are not thoroughly seen. If abnormalities are found, conventional endoscopy is still needed.

Esophageal Biopsy

Tissue samples are collected during endoscopy to determine the presence of neutrophils and eusinophils. This test is not specific histologic findings for GERD.

Esophageal pH Monitoring

Standard test for establishing pathologic reflux. pH monitoring is carried out for 18 to 24 hours thru a catheter or probe inserted nasally and positioned 5cm above the LES measuring number of reflux episodes and duration in upright and supine position. Reflux episodes are defined by a pH drop of less than 4.

Barium Esophagram

It is an inexpensive, readily available and non invasive esophageal test. Most useful in demonstrating anatomic narrrowing of the esophagus. It allows good assessment of peristalsis and is helpful in identifying a weak esophageal pump. Barium esophagram test is an inspection of the esophagus. The test is conducted as a part of a series of tests carried out on the upper and the middle regions of the GI tract. This test is performed using fluoroscopy, barium, and x-rays. Since barium is a contrast material, it is used as a marker. The patient is asked to swallow the barium with water, and as the barium travels down the esophageal passage, the path is mapped.

Esophageal Manometry

Esophageal manometry is a test used to measure the function of the lower esophageal sphincter (the valve that prevents reflux of gastric acid into the esophagus) and the muscles of the esophagus. It allows assessment of LES pressure and relaxation as well as peristaltic activity including contraction

amplitude, duration and velocity. During esophageal manometry, a thin, pressure-sensitive tube is passed through your mouth or nose and into your stomach. Once in place, the tube is pulled slowly back into your esophagus. When the tube is in your esophagus, the patient will be asked to swallow. The pressure of the muscle contractions will be measured along several sections of the tube.

Treatment

The rationale for GERD therapy depends on a careful definition of specific aims. In patients without esophagitis, the therapeutic goal is to relieve reflux symptoms and prevent relapses. In patients with esophagitis, the goals are to relieve symptoms and heal esophagitis while preventing relapses and complications.

Non-Prescription Therapy

a) Lifestyle Modification

OTC

Maintenance Therapy/Prescription Medications

H2RAs

PPI

Promotility/Prokinetic drugs

3. Surgical Therapy

Endoscopic Therapy

Non-Prescription Therapy

a) Lifestyle Modifications

This is the initial management plan and especially helpful in those with mild, intermittent symptoms.

elevating head of bed
avoid tight fitting clothes = aims at reducing incidence of reflux by abdominal stress mechanism
lose weight if overweight = weight gain can be associated with exacerbation of symptoms
restricting alcohol and smoking = both agents lower LES pressure, reduce acid clearance and impair protective functions in the stomach making dietary changes = reducing stimulation of gastric acid secretion refraining from lying down after meals
avoiding bedtime snacks = keeps the stomach empty at night, decreasing night reflux episodes.

b) Over-the-counter medications

These drugs are used in treating mild, infrequent heartburn symptoms triggered by lifestyle indiscretions. Drug labeling for OTC drugs suggests daily use for only 2 weeks and then recommends to physician follow up if symptom persists. Antacids: Basic compounds that neutralize gastric acidity and decrease the

rate of gastric emptying. They are divided into those containing aluminum, magnesium, calcium or a combination of these.

Use: It decreases hyperacidity in conditions such as peptic ulcer disease, reflux esophagitis, gastritis and hiatal hernia.

Side Effects: Constipation, fecal impaction, bowel obstruction. Diarrhea with Magnesium. Alkalosis.

Contraindications: Sensitivity to Aluminum, Magnesium and Calcium products.

Precautions: Should be cautiously given to patients with renal insufficiency, hypertension, CHF and pregnant and breastfeeding women.

PharmacokinetIcs: Duration is 20-40 minutes. If ingested 1 hr after meals, acidity is reduced for at least 3 hrs.

Interactions: Products whose effects may be increased by antacids: Quinidine, Amphetamines, Pseudo ephedrine, Levodopa, Valproic Acid.

Effects may be decreased by antacids: Cimetidine, Corticosteroids, Ranitidine, Iron Salts, Phenytoin, Digoxin, Tetracyclines, Ketoconazole,

Salicylates, Isoniazid.

Nursing Considerations: Assess aggravating & alleviating factors by Identifying location, duration and characteristics of epigastric pain.

Antacids should not be used if severe abdominal pain with fever occurs.

Do not administer other products within 1-2 hrs of antacid administration due to impairment absorption. Administer antacids with an 8 oz of glass of water. Evaluate for absence of epigastric pain and decreased acidity.

Examples of Antacids: Calcium Carbonate, Bismuth Salicylate, Magnesium

Oxide, Magaldrate, Sodium Bicarbonate, Aluminum Hydroxide.

Maintenance Therapy/Prescription Medications

Histamine-2 Receptor Antagonists (H2RAs)= Acts by inhibiting histamine at the H2 receptor site in parietal cells which inhibits gastric acid secretion.
Use: Short term & maintenance treatment of duodenal & gastric ulcers and GERD.
Side Effects: common: confusion, headache & diarrhea adverse: agranulocytosis, thrombocytopenia, neutropenia, aplastic anemia, exfoliative dermatitis
Contraindications: hypersensitivity to this products

Precautions: Cautions should be used in pregnancy, breastfeeding, children 5), Monitor I & O ratio, BUN,
creatinine, CBC, Administer with meals for prolonged effect. Antacids should be one hr before or after. Evaluate for therapeutic response like decreased pain in abdomen.
Examples: Cimetidine, Famotidine, Ranitidine

Proton Pump Inhibitors = class of drugs that decrease gastric acid secretion through inhibition of hydrogen and potassium ATPase, the proton pump of the parietal cell. Use: GERD, severe erosive esophagitis, duodenal & gastric ulcers, dyspepsia Side Effects: common: headache, diarrhea adverse: osteoporosis Contraindications: Hypersensitivity

Precautions: Pregnancy, breastfeeding, children, proton pump hypersensitivity
Pharmacokinetics: Peak 2. 4 hr, duration 24 hrs. Eliminated in urine as

metabolites and feces. decreases rate of elimination in geriatrics

Interactions: decreases absorption of Ketoconazole, Clopidogrel. Increases absorption of Digoxin, Warfarin, Diazepam, Phenytoin

Nursing Considerations: Assess bowel sounds, abdominal pain, swelling. Monitor hepatic studies (AST, ALT), Vit B12 deficiency in long term therapy. Evaluate for therapeutic response like absence of epigastric pain, swelling & fullness Examples: Omeprazole (Prilosec), Esomeprazole (Nexium), Lansoprazole

(Prevacid), Pantoprazole (Protonix)

Promotility/Prokinetic Drugs = These drugs improve reflux symptoms by increasing LES pressure, acid clearance, or gastric emptying. Use: GERD, prevents nausea, vomiting induced by chemotherapy/radiation Side Effects: Common: headache, abdominal cramps, urinary frequency,

flushing, blurry vision. Adverse: Lethargy, anxiety, restlessness & tremor, dystonia, tardive dyskinesia, parkinsonism

Contraindications: hypersensitivity to this product, procaine or procainamide,

seizure disorder, pheochromocytoma, breast cancer & GI obstruction

Precautions: Pregnancy, breastfeeding, GI hemorrhage, CHF, Parkinson’s disease

Pharmacokinetics: Metabolized by liver, excreted in urine. half life of 4 hrs, duration of 1-2 hrs

Interactions: Avoid use of MAOI’s, alcohol, CNS depressants Nursing Considerations: Assess for GI complaints like nausea, vomiting, anorexia, constipation. Assess for mental status like depression, anxiety & irritability. Evaluate therapeutic response like absence of nausea, vomiting, anorexia & fullness Examples: Metoclopramide, Bethanecol, Cisapride

Surgical Therapy

Fundoplication

The only surgical intervention that can correct the physiologic factors contributing to GERD and potentially eliminating the need for long term medication. Antireflux surgery reduces GER by increasing basal LES pressure,

decreasing episodes of transient lower esophageal sphincter relaxation (tLESR’s) & inhibiting complete LESR. This is done by reducing the hiatal hernia into the abdomen, reconstructing the diaphragmatic hiatus and reinforcing the LES. Side effects: dysphagia, gas bloat, diarrhea, increased flatus and herniation which requires reoperation.

Endoscopic Therapy

Minimally invasive outpatient treatments that alter the structure at the gastroesophageal junction to prevent reflux of the gastric contents. All these techniques decrease reflux symptoms, improve quality of life and decrease the need for antisecretory medications. Side effects are chest pain, bleeding, esophageal perforations, mediastinitis and death.

Radio frequency energy

Injection of bulking agent

Bioprosthesis in the LES

Suture plication of the proximal gastric folds

Delivery of radio frequency energy to the gastroesophageal junction

Endoscopic treatment delivers high frequency thermal energy to the lower esophageal sphincter (LES). This treatment is proposed to cause stiffening of the area to resist stretching when the stomach is full thus creating a barrier to reduce the flow of stomach acid.

Injection of bulking agents

This technique use bulking agents such as Polymethylmethacrylate (PMMA) or Plexiglas microspheres that are injected into the lower esophageal lining. The materials implant into the submucosa for bulking of the tissues supposedly causing constriction and lengthening resulting in the reduction of reflux.

Implantation of a bioprosthesis into the LES

Such devices are surgically implanted in the vicinity of the lower esophageal sphincter (LES) to support and augment the function of the LES, with the goal of decreasing or stopping the reflux of stomach contents up into the esophagus.

Suture plication of the proximal gastric folds

Also known as endoscopic gastroplasty or endoluminal gastroplication, these endoscopic treatments use mechanical suturing techniques at or below the

gastroesophageal junction to strengthen and lengthen the sphincter in order to create a barrier for the reverse flow of acid.

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