An Integrative Approach to GERD (Gastroesophageal Reflux Disease)

Introduction

Gastroesophageal reflux disease (GERD), or "heartburn", is a common phenomenon; it is estimated that 15-20% of people in the United States have heartburn or regurgitation at least once a week, and 7% of people suffer from those symptoms daily.[1-3] GERD occurs due to the abnormal passage of acidic stomach contents, or refluxate, into the esophagus, though there is a poor correlation between the severity of symptoms and the pathophysiological findings in the esophagus.[3] A variety of symptoms occur with GERD, including retrosternal burning, acid regurgitation, nausea, vomiting, chest pain, laryngitis, cough, and dysphagia.[2] The injury to the esophagus can include esophagitis, stricture, the development of columnar metaplasia (Barrett's esophagus), and adenocarcinoma.[3]

People may turn to complementary and alternative medicine (CAM) to help with their gastrointestinal symptoms; the 2002 National Health Interview Survey, based on 31,044 interviews in the United States, documented that 3.7% of people used CAM therapies for stomach or intestinal illnesses.[4]

Pathophysiology

There are many factors that affect the degree to which GERD causes symptoms, though some abnormality in the lower esophageal sphincter (LES) is thought to be the major pathological mechanism.[5] The LES is one barrier to the passage of refluxate into the esophagus, the other two being the crural diaphragm (which acts as an external esophageal sphincter), and the fact that the gastroesophageal junction is located below the diaphragmatic hiatus.[1] Normally, the LES exists in a contracted state, but it will relax during swallowing to let material into the stomach, to vent swallowed air, with the ingestion of many substances or medications, and because of other factors.[1,5-11]
(See Table 1 on the next page).

Symptoms of GERD may also result from increased intra-abdominal pressure (such as from obesity, ascites, pregnancy, or even tight clothes), when the gastric contents are located near the gastroesophageal junction (such as in the recumbent position, bending over, or with a hiatal hernia), or with decreased saliva.[1,12] Emotional stress may cause a worsening of GERD, especially in people with high levels of anxiety.[13-14]

Integrative Therapy

1. Lifestyle

In mild cases of GERD, lifestyle modifications are the first line of therapy and can lead to symptom improvement or elimination. For example, GERD symptoms may improve if smokers quit, and obese patients lose weight.[1,6] Avoidance, if possible, of factors that relax the LES should be explored (see Table 1). For nighttime symptoms, elevate head of bed four to six inches using blocks under the bed posts; the use of extra pillows for head elevation may actually compress the abdomen, increase intra-abdominal pressure, and exacerbate GERD.[1,3,6]

Another useful nighttime intervention can be supplemental melatonin. Melatonin may promote the secretion of gastric bicarbonate and improve the activity of the LES by inhibiting nitric oxide.[15] Small, preliminary clinical trials using a formula with melatonin, vitamins and amino acids, either alone or in combination with proton pump inhibitors (PPIs) have shown benefits in people with GERD; follow-up research is needed to corroborate these results and further guide the clinical use of melatonin for GERD.[15] Dose: 2.5mg.

Table 1: Factors Associated with Decreased Tone of the LES[1,5-8]

FACTOR	EXAMPLES
Dietary supplements	• arginine may cause LES relaxations via the nitric oxide system • carminative herbs such as peppermint (*Mentha* x *piperita*), spearmint (*Mentha spicata* and other mint family (Lamiaceae) plants • essential oils (high doses)
Foods/Beverages	• alcohol • chocolate (probably via the methylxanthines) • coffee (caffeinated more than decaffeinated) • cow's milk • fat • orange juice • spicy foods • tea • tomato juice
Lifestyle	• smoking
Medications	• aminophylline • anticholinergics • beta-adrenergics • calcium channel blockers • nitrates • phosphodiesterase inhibitors including sildenafil
Physiologic, via stomach dilatation	• acid hypersecretion • after meals • gastric stasis • pyloric obstruction
Trauma/irritation/miscellaneous	• esophagitis • scleroderma-like diseases • surgical damage

2. Nutrition and Exercise

Both exercise and nutrition can have a significant impact on symptoms of GERD. As mentioned above, certain foods and beverages may, via LES relaxation, lead to the exacerbation of GERD (see Table 1). People suffering from GERD should try to eliminate the foods and beverages, as well as the other substances, as listed in Table 1, for a minimum of two weeks, closely monitoring symptoms. If there is an improvement in symptoms, either all of those foods could continue to be avoided, or each week a different food could be added back into the diet, watching for a recurrence of symptoms. See our handout GERD Elimination Diet for more information on this process.

There are two other dietary nuances for GERD sufferers: high-fiber diets seem to decrease GERD; and, while most experts recommend lower consumption of cholesterol, saturated fatty acids, and total fat for GERD, there are mixed results in the medical literature on this topic, including the fact that the dietary fat-GERD connection seems to be mostly a function of higher body mass index (BMI).[16] With respect to the effect of alcohol or coffee consumption on GERD symptoms, again there are mixed results in the medical literature, with individual trials showing increased, decreased, or no change in GERD symptoms.[16]

Regular activity is important for ideal gastrointestinal function and overall digestion; the conventional wisdom is that enhanced peristalsis connects to improved stomach emptying, less mechanical stress on the LES, and improved LES muscle function and tone. Regular physical activity at leisure time is correlated with fewer symptoms of GERD, with some of this connection due to the fact that GERD sufferers at baseline may be less active.[16] Leisure time exercise is better than work time exercise; the latter is often associated with post-prandial exercise, a risk factor for GERD. Some people who partake in vigorous exercise, especially running, weight lifting, and, less so, cycling, may actually have an increase in GERD.[16] The increase in GERD with vigorous exercise may be due to decreased gastrointestinal blood flow, increased esophageal contractions, and compromise of the esophagogastric junction.

3. Botanical (Herbal) Medicine

- **Licorice.** Demulcent, or mucilaginous, botanical medicines can be used as mucoprotection of the esophageal mucosa to soothe irritated tissues and promote healing.[6,7] For example, licorice (*Glycyrrhiza glabra*) is a well-known demulcent botanical used for GERD, gastritis, and duodenal and peptic ulcers. For long-term use, it should be prescribed as deglycyrrhizinated licorice (DGL) in order to avoid the side effects of one of its phytochemicals, glycyrrhizin; the prolonged use of decoctions or infusions of dried, unprocessed licorice root can cause hypertension, hypokalemia, and edema, due to the mineralocorticoid action of a saponin glycyrrhizin, also called glycyrrhizic acid.[17] It is commonly used as two to four 380 milligram lozenges before meals.[18]

- **Slippery Elm.** Slippery elm (*Ulmus fulva*) root bark powder is another useful demulcent for GERD. One to two tablespoons of the powder are mixed with a glass of water and taken after meals and before bed. The proportions should be carefully titrated as the preparation can be very thick and difficult for some people to tolerate; to increase its palatability, it can be sweetened slightly with honey or sugar. This botanical is described by most sources as very safe, though the hyrdocolloid fibers may bind simultaneously administered medications and decrease their absorption.[17]

- **Marshmallow.** Marshmallow (*Althea officinalis*) is another mucilaginous herb for GERD symptomatic relief. Its demulcent properties also make it useful for pharyngitis, wound healing, cough, and bronchitis. It is usually dosed 5-6 grams (about 2-3 tablespoons) daily, in divided doses, as an infusion of the leaves or root.[18] As with slippery elm, there may be a decrease in absorption of orally administered drugs taken simultaneously with marshmallow.[17]

- **Chamomile.** Chamomile (*Matricaria recituta*) is well known for its mild sedative actions and for its anti-spasmodic effects on the gastrointestinal tract. In GERD, it is used as a non-demulcent anti-inflammatory.[6,7] Chamomile is most commonly used as a hot water infusion (tea) of 1-3 grams (about 1 tablespoon) of the flowers, steeped in a cup covered with a saucer, taken three to four times daily.[11] Chamomile is generally well-tolerated, though individuals allergic to other plants in the daisy family (Asteraceae) may experience an exacerbation of their allergic symptoms with consumption of chamomile.

- **Combination Botanical Products.** There is a meta-analysis of combination botanical product called *Iberogast*® that includes Clown's mustard, German chamomile, angelica root, caraway, milk thistle, lemon balm, celandine, licorice root and peppermint leaf. This review supported its use in the treatment of dyspepsia showing a reduction in epigastric pain, cramping, nausea and vomiting compared to placebo[19] It is usually dosed at one milliliter three times daily and is usually well-tolerated, though for some people it may cause nausea, diarrhea and skin rash.

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4. Pharmaceuticals

Both H2-receptor antagonists, or “blockers” (H2Bs) and PPIs are commonly used for the symptoms of GERD. A recent meta-analysis showed that both H2Bs and PPIs are effective in GERD symptomatic improvement, but that PPIs are significantly more effective than H2Bs.[20] PPIs are also used as a one-week therapeutic trial to empirically test and diagnose GERD.[1] The optimal dosing time for PPIs is 30 minutes before a meal, though adherence to the ideal dosing regimen may or may not lead to better symptom control.[21] Some clinicians indefinitely use H2Bs or PPIs as necessary to control symptoms.[3]

Concerns regarding the health consequences of long term acid suppression are increasing. Chronic acid suppression has been shown to compromise digestion, increase the risk of infections, and possibly increase the risk of cancer and fractures.

- **Chronic Acid Suppression Effects on Digestion**
  - **Decreased digestion of protein.**[22] Protein is digested both directly by hydrochloric acid (HCL) hydrolysis and indirectly by the HCL conversion of the precursor pepsinogen to the active protein digesting enzyme pepsin. It takes only days of PPI use to raise the pH of the stomach above the level necessary to activate pepsinogen. The increased use of PPI may help explain the increased risk of eosinophilic esophagitis where the immune system along the GI track is reacting to food proteins that have not been digested adequately due to the deactivation of pepsinogen, essentially a food allergy or intolerance.[23,24]
  - **Decreased absorption of iron, specifically non-heme iron.**[25,26] HCL releases non-heme iron from its fiber carrier and then dissolves it.
  - **Decreased absorption of vitamin B_{12}.**[27,28] HCL is needed to release vitamin B_{12} from its carrier protein so that it can then combine with intrinsic factor to later be absorbed in the terminal ileum.
  - **Decreased absorption of calcium.**[29] Calcium is a relatively in-soluble molecule and likes to bind to fiber. Thus it needs HCL to dissolve and release it from its fiber carrier.

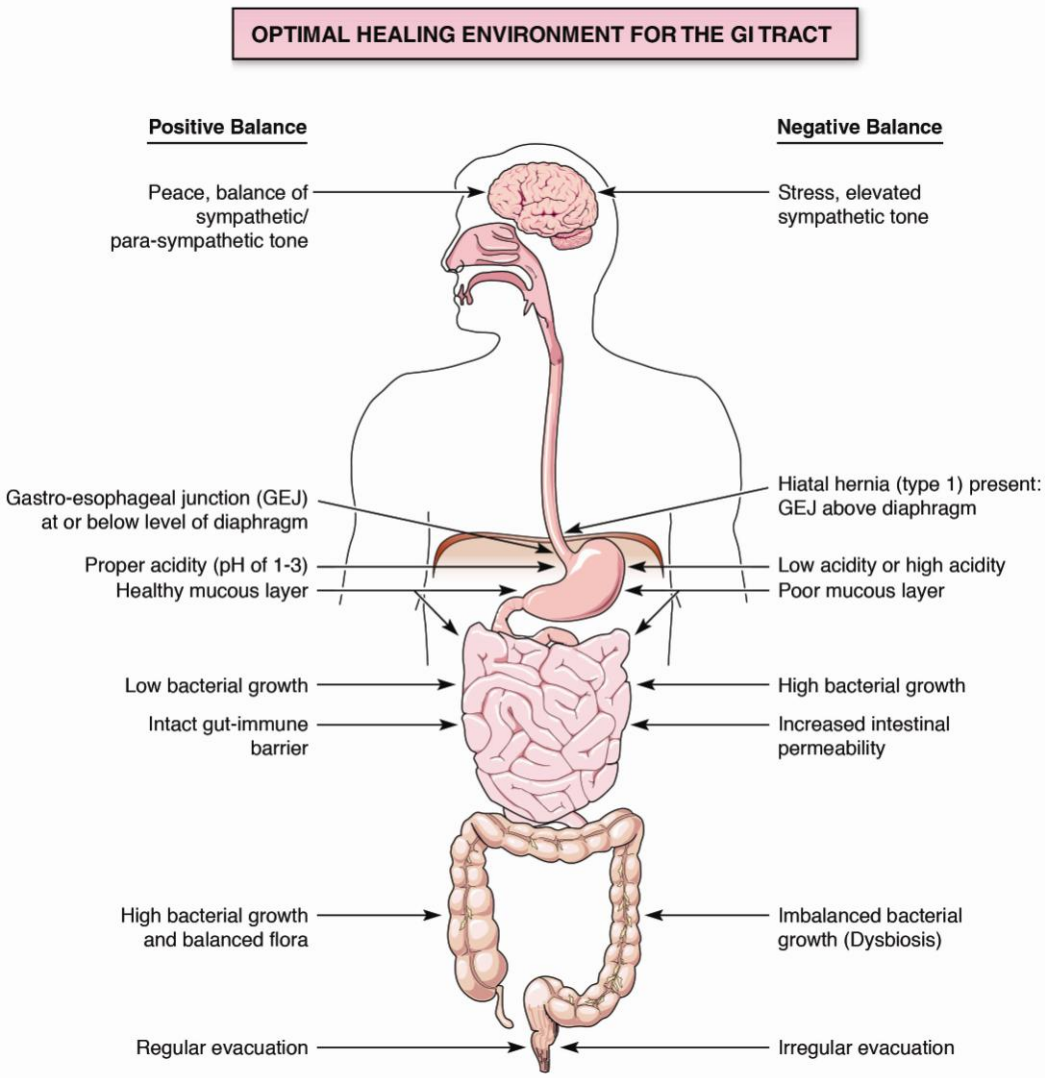
- **Chronic Acid Suppression Effects on Immune-Protection**
  - **Increased risk of acute gastroenteritis and community-acquired pneumonia in children.**[30] Many children are now being treated with some form of acid suppression to treat GERD. In one study, 2 months use of ranitidine or omeprazole in children 4-36 months resulted in significant increases in gastroenteritis (47% vs. 20%) and community acquired pneumonia (12% vs. 2%) vs. controls.
  - **Increased risk of community-acquired clostridium difficile infection.**[31] In a large population based case-control study, chronic use of histamine receptor antagonists and proton pump inhibitors increased the risk of community-acquired clostridium difficile infection 8% vs. 4% and 23% vs. 8% respectively compared with controls.
  - **Increased risk of community-acquired pneumonia.**[32] In a large cohort study, the use of acid suppressive drugs (both H2 blockers and PPI's) was associated with an increased risk of community acquired pneumonia. This risk translated to 1 case of pneumonia per 226 patients treated with PPI's and 508 persons treated with H_2 blockers.

- **Chronic Acid Suppression and Cancer**
  - **Increased gastric carcinogens.**[33] Culture studies of gastric contents at different pH's have demonstrated increased bacteria in the stomach with lower acidity. Therefore, a hypothesis describes that the increased bacteria in a stomach under chronic acid suppression will allow increased conversion of nitrates (present in the diet) to nitrite that are subsequently converted to the carcinogenic compound N-Nitrosamine.
  - **Increased enterochromaffin cell hyperplasia.**[34] Low acidity due to chronic acid suppression stimulates the chronic release of gastrin in an attempt to restore normal gastric acidity. This subsequently leads to hypergastrinemia that has been shown to induce tumors. These changes may occur over decades.

- **Chronic Acid Suppression and Fractures**
  - There may be an increased risk of hip[35,36] and spine[37,38] fractures with long term acid suppression.

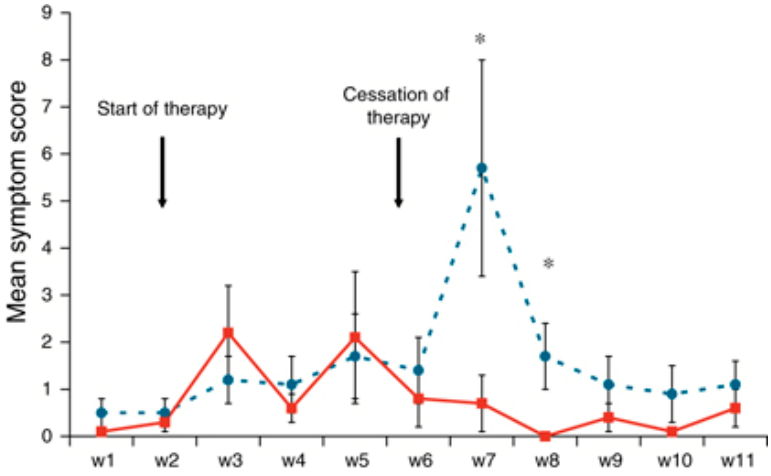
Considerations with Chronic Acid Suppression

- Beware of unresponsiveness to oral iron replacement in persons using chronic acid suppression medicines.
- Reassess patients who are taking acid-suppressive drugs for a long time for vitamin B_{12} status because of potentially irreversible neurologic complications.
- Consider risk-benefit of acid suppression in those at increased baseline risk for community acquired pneumonia (e.g. elderly, asthma or COPD, immune-compromised, children).
- Hypergastrinemia induced tumor changes may occur over decades and therefore utilize caution with consideration of chronic acid suppression use in children and persons less than 40 years of age.



Helping taper off a proton pump inhibitor

For those patients who have made positive lifestyle changes and may not need continued chronic acid suppression, it can be difficult to come off PPIs since they often cause rebound hyperacidity even if the underlying condition has resolved.[39] This chart shows symptoms of dyspepsia in ASYMPTOMATIC people given 40 mg of pentoprazole for 6 weeks. Rebound dyspepsia lasted 10-14 days.[39]



Blue = Took PPI; Red = Placebo group

Plan

1. Focus on nutrition. Common foods that should be avoided in those with GERD include: alcohol, caffeine (coffee), chocolate, cow's milk, animal fat and orange juice.

2. Slowly taper off the PPI over 2-4 weeks (the higher the dose, the longer the taper).

3. While the taper is being completed, use the following for bridge therapy to reduce the symptoms of rebound hyperacidity.
   - Encourage regular aerobic exercise.
   - Encourage a relaxation technique such as deep breathing. (This enhances vagal stimulation, encouraging digestion and aids adequate peristalsis. See our handout *Breathing Exercise*).
   - Acupuncture 1-2 times per week[40]
   - Add one or more of the following:
     - Deglycyrrhizinated Licorice (DGL), 2-4 380 mg tablets before meals or Sucralfate *(Carafate)* 1 gm before meals.
     - Slippery Elm, 1-2 tbsp of powdered root in water or 400-500 mg capsules or 5 ml of a tincture three to four times/daily.
     - A combination botanical product, *Iberogast*® 1 ml three times/daily[41] (Can get here: Iberogast on Amazon)*

4. If patient is successful, slowly taper off the above (except for positive nutritional changes, exercise and stress management). If symptoms return, start with one of the above or an H2-Blocker. If symptoms are still difficult to control, consider adding the PPI back.

5. Ideally it would be beneficial to avoid long-term acid suppression if possible since this can be associated with malabsorption of vitamin B12 and iron,[42] increased risk of community acquired pneumonia,[32] hip[35,36] and spine[37,38] fracture, and C. diff diarrhea.[43]

5. Mind-body therapy

Relaxation training can improve symptoms of GERD, addressing the fact that stress exacerbates GERD symptoms, especially in people suffering from chronic anxiety.[13] The following are links to some of our other handouts that provide information about using mind-body techniques:

- *Learning to Meditate (clinician version)*
- *Learning to Meditate (patient version)*
- *Breathing Exercise*
- *Using Journaling to Aid Health*

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6. Traditional Chinese Medicine (TCM)

TCM provides a complete assessment based on a unique cultural, diagnostic, and therapeutic approach and could offer relief for people suffering from GERD. This modality incorporating diet, lifestyle, botanical medicines, and acupuncture/acupressure,[44] should be considered as a therapeutic option, either based solely on a patient's personal preference, or the need for adjunctive therapies to incomplete or ineffective allopathic therapeutics. One interesting study of acupuncture for GERD found that adding acupuncture to PPI therapy for people with GERD was more effective than simply doubling the PPI dose.[45]

7. Surgery

Surgery is considered by many experts to be an option for people failing lifestyle modification or adequate medical therapy, or who are unwilling to take long-term medication.[1,2,46] The most common surgical procedure is the Nissen fundoplication, either open or laparoscopic, whereby the fundus of the stomach is wrapped wholly (total fundoplication) or partially (partial fundoplication) around the lower esophagus to create an area of high pressure meant to prevent refluxate from entering into the esophagus and causing symptoms. The laparoscopic fundoplication has similar long-term disease control with less incisional hernias than the open approach.[46] One review examined health-related quality of life and GERD symptoms after one year in four studies involving 1232 people who underwent medical management versus laparoscopic surgical management.[2] Overall, the surgical approach seemed to improve symptoms of GERD more than medical management, though there may be more dysphagia and costs after one year in people who undergo surgery.[46] One review and meta-analysis found that the partial laparoscopic fundoplication had less post-operative dysphagia than total fundoplication.[46]

We have also developed a corresponding handout for patients on this topic.

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