

## GASTRO-ESOPHAGEAL REFLUX DISEASE; OVERVIEW AND MANAGEMENT APPROACH

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### ABSTRACT.

**Background:** Gastroesophageal reflux disease is one of the most common complaints in the medical field. Increased acid production and relaxation of the lower esophageal sphincter are considered the most common causes of this disease. Patients could present with epigastric pain that can be radiated to the left shoulder and can lead to a similar presentation of cardiac disease. Treatment could be non-pharmacological like weight loss and lifestyle modifications or pharmacological like given PPI other medications or surgical for refractory cases. **Objective:** The objective of this review is to discuss Gastro-esophageal reflux disease, different presentations, and management plans with great details. **Method:** We searched the PubMed database looking for relevant articles to the topic using Mesh terms, "Gastro-esophageal reflux disease". **Conclusion:** Gastro-esophageal reflux disease is a common condition, the early diagnosis, and treatment, will not only treat your patient, and rather, it will prevent serious complications like malignancy.

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### Introduction

Gastroesophageal reflux disease (GERD) is one of the most common diseases in the gastrointestinal tract [1-3]. It is characterized by retrosternal pain and heartburn sensation; it has a prevalence of 18.1% to 27.8% in America [4]. Nowadays, GERD's treatment course has shown a potent efficacy in treating the disease and relieving symptoms. It's also cost-benefit; it is not expensive compared to its effectiveness [5]. In previous decades, GERD complications were one of the most dangerous complications because it leads to malignancies like adenocarcinoma in the lower esophageal part. In this review, we will briefly discuss the pathophysiology, diagnosis, and epidemiology. We will focus on disease management, both pharmacological and non-pharmacological since it plays a significant role in treating and preventing the disease and thus the complication.

### Epidemiology

Gastroesophageal reflux disease (GERD) is the most common presentation of non-cardiac chest pain –heartburn sensation– and the most common indication for endoscopy, the prevalence of GERD is 27.8% in America, 25.9% in Europe, 11.6% in Japan, and 14.4% in the Middle east some studies correlate the increasing of prevalence into daily Alcohol consumption [6].

### Pathophysiology

Two main pathophysiological factors contribute to GERD's pathophysiology: the first one of them is related to LES (lower esophageal sphincter), and the second one is associated with increase acid production [7]. There is some TLESR (transient lower esophageal sphincter relaxation) in some patients, not related to swallowing. In swallowing, there is an o\physiological relaxation that happened to the lower esophageal sphincter to decrease the sphincter tone and allow the food to pass into the stomach [7]. Still, this relaxation is pathological in GERD because it is not related to swallowing and thus enable some food

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to reflux into the esophagus, causing the sour-tasting in the mouth [7]. A lot of researches has been conducted to find the definite cause of this TLESR. Still, there is no actual cause found, but some correlations have been approved like Caffeine, Alcoholism, and smoking. The second main cause is the increase in acid production, physiologically the HCL acid is secreted from the parietal cells in the stomach those cells are excited by a lot of factors like Gastrin which is secreted from the G cell in the stomach antrum, Parasympathetic innervations through muscarinic receptors M3 and Histamine which secreted from ECL cells (enterochromaffin-like cells) which can act directly on parietal cells or by enhancing the Gastrin effect on parietal cells [8].

## Discussion

### Diagnosis

For GERD diagnosis, the physician usually uses the combination therapy between the clinical manifestation and the empirical treatment therapy, which shows a high specificity reaching 97% [9]. The GERD patients typically present with heartburn sensation, and retrosternal pain maybe radiates to the left arm. This can sometimes be mixed wrongly with cardiac abnormalities and sour-tasting in mouth refluxed food. In empiric therapy, we give the patient a PPI course Omeprazole, for example, for two weeks, and if his symptoms improved, the diagnosis could be confirmed, if the symptoms do not improve, we cannot approve the GERD [10]. Ambulatory pH monitoring allows the physician to measure the acidity in the esophagus and monitor it for 24 hours, for example, to know if there is any acid reflux into the esophagus or no, but this procedure is done transnasal tube so it can be irritated to the patient [11]. Upper endoscopy is not a tool to confirm GERD's diagnosis because most GERD patients may reveal normal upper endoscopy pictures. The upper endoscopy can measure the GERD effect on the esophageal mucosa and complication of GERD like Barret syndrome or esophagitis, so it is not a diagnosing tool [12]. Barium esophagogram is considered now as a screening tool more than a diagnosing one since it can give a clearer picture for dysphasia or motility abnormality of the esophagus, not mucosal structure abnormalities or acid reflux into the esophagus [13].

### Alarming symptoms and complications:

In GERD patients with not complicated conditions, long-life medical treatment can be beneficial. Still, for inpatients with red flags, surgical intervention should be done before the worst things come [7]. Those red flags are esophagitis, Barret's esophagus, esophageal adenocarcinoma, and esophageal strictures [7]. All these conditions can lead to a life-threatening complication for the patient and can be fatal, esophageal esophagitis is an inflammation of the esophageal mucosa due to the acid's irritation and increases inflammatory cytokines, and this is the most common complication of GERD by 30% [7]. Esophageal stricture is narrowing of the esophagus by fibrosis like a healing process of the recurrent mucosal damage occurs to the esophagus by 25%, it causes dysphasia and odynophagia [7]. Barret's syndrome is Intestinal metaplasia that happens in the esophagus, and it is considered a premalignant stage that can develop esophageal adenocarcinoma within five years if left untreated [14].

### GERD Management

#### Non-Pharmacological:

Non-pharmacological therapy mainly tends to prevent complications and to treat symptoms. The most important thing is lifestyle modification, which decreases weight, especially in obese patients. Obesity is one of the most common risk factors for GERD can be reduced by bariatric surgery if it is super obesity –more than 40 BMI- or by increasing physical activity and diet or food restriction in acceptable obesity, eating small meals with avoiding spicy and highly fatty foods in addition to eating in a specific time , not before sleeping, do not drink fluids while eating but after the meals [15]. Elevate the head during the night while sleeping will help the diaphragm compress the esophagus and prevent any food reflux while sleeping [15]. Sleeping on the left side has also been approved to have a beneficial effect on GERD patients [15]. Quitting smoking and decreasing drinking Caffeine also decrease gastroesophageal reflux disease symptoms by reducing acid production, stopping drinking alcohol, and positively affecting the lower esophageal sphincter (LES) tone by decreasing the acid production [15].

#### Pharmacological treatment:

there are three classes to treat GERD: H2 blocker, PPI, and Antacids are mainly the drugs used for GERD patients also can be taken without prescription.

#### *Antacids and Alginate:*

The antacid is a chemical compound such as Magnesium Carbonate, Aluminum Carbonate, which can be described to neutralize the acidity of the stomach (raising the stomach pH), which decreases the acidity and the acid reflux [16]. Alginate is a chemical compound molecule like a gel, has been approved o have a protective effect for the esophageal mucosa and blocking any post-prandial acid or food reflux [16]. The combination of alginate and antacids has shown a very protective and beneficial effect in treating GERD more than PPI alone [17]. They have a good impact on reducing stomach pH and protecting esophageal mucosa when they are administered together [17].

### **Proton pump inhibitor:**

PPI is the most effective drug in treating gastroesophageal reflux disease; it is also used to treat peptic ulcers and Zollinger-Ellison syndrome [18]. Proton pump inhibitor such as Omeprazole inhibits and prevents the acid secretion by binding irreversibly with the H/K pump in the parietal cells and thus preventing the secretion of HCL acid to increase the stomach pH [19]. PPI has the fastest effect in elevating the stomach pH than the H2 blocker, and it has the best symptoms relieving by only a dose daily, not like the antacid, which needs about two doses in a day; this effect due to the high half-life that the PPI has [7]. The PPI has the best effect in short term courses, which is about 10-14 days, to relieve the symptoms [7].

The long-term use of proton pump inhibitors has shown a lot of undesired side effects. The most important one is chronic kidney failure, which is not fully understood until now, but it is more common in elderly patients [20]. In addition to chronic kidney failure, PPI has been approved to cause osteoporosis (increasing susceptibility to bone fractures); because of decreasing the Calcium absorption in high pH, the Ca needs a highly acidic environment to be absorbed same as Iron and vitamin B12 [20]. The patient who is in long-life PPI may suffer from iron deficiency or B12 deficiency and so from anemia and sometimes from malnutrition in some cases [20]. In some conducted researches, long-term proton pump inhibitors have been approved to increase the risk of gastric malignancy due to increasing pH and so increasing the risk of infection, especially *C.difficile* Bacteria because the gastric acidity of the stomach considered as one of the infection barriers against microbes [21]. In addition to the mucosa and tight junctions, increasing of malignancies risk can also be explained by achlorhydria that can be happened in those patients [21]. One of the most common rationales for prescribing long life PPI is a combination therapy of PPI with long life NSAIDS (non-steroidal anti-inflammatory drugs) [7].

### **Histamine 2 receptor antagonists (H2RAs):**

H2 blockers decrease gastric acid secretion through the inhibition of histamine stimulation of the parietal cell and thus decrease the production of acid in the stomach [19]. Recent studies have shown that PPI is superior to H2RAs and thus it is used more frequently [19].

### **Surgical treatment:**

The Anti-Reflux surgery should be done after pH testing and endoscopy, in addition to esophageal manometry, to exclude any abnormal motility disorders of the esophagus like achalasia [22]. The best patient outcomes are patients with positive abnormal ambulatory pH. The surgical procedure that is done for patients with GERD is Laparoscopy, and especially the posterior laparoscopy fundoplication it is the most common technique that is used and has the best outcomes over the anterior laparoscopy fundoplication [23]. In the anterior one, the recurrent heartburn sensation is more common, as well as food reflux [24]. Recent surgical intervention has been launched nowadays, which is LINX<sup>tm</sup> reflux management system; it is a titanium bead with a magnetic core connected with titanium wires to form a ring, and this ring after formed can be put around the lower esophageal sphincter by laparoscopy to prevent any acid or food reflux, but a lot of patients reported dysphasia after using this LINX system about 68% of the patients [22].

### **Conclusion**

GERD is one of the most common diseases among GI disturbance disease that can mimic cardiac problems since it is presented by retrosternal pain and heartburn sensation in addition to radiating pain into the left arm. It is prevalent in female, fat, forty, fertile patients in addition to the smoker, high daily alcohol consumption, or high Caffeine intake due to TLESR (transient lower esophageal sphincter relaxation) and increase acid production. The essential line treatment in treating GERD is PPI such as Omeprazole, for short-term courses about 10-14 days, not for long life treatment because of unwanted side effects like increasing bone fractures, renal failure, and increase risk of gastric malignancies.

Using PPI has shown better results than anti-reflux surgical intervention such as Posterior laparoscopy fundoplication and LINX system because of side effects and post-surgical complications.

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