Gastric Acid Physiology and GERD, Ulcer, and Gastritis Pathophysiology

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Physiology Of Normal Gastric Acid Production

Gastric acid is a combination of hydrochloric acid, sodium chloride, and potassium chloride that is produced by the parietal cells of the stomach in response to stimulation by the presence of food in the stomach. The essence of gastric acid in the digestion process is to aid in the breakdown of proteins through the activation of digestive enzymes like pepsinogen. The production of gastric acid is controlled through a feedback loop that ensures that it is produced according to the needs of the body. The production of other compounds like bicarbonate and mucus protects the lining of the stomach from acid and enzymatic destruction. The regulation of this digestive process is carried out by the autonomic nervous system and hormones. Disruption of any of the regulatory processes leads to a medical condition which is primarily signified by excessive gastric acid production and destruction of the stomach lining (Schubert, 2016).

Pathophysiology Of Gastro-Oesophageal Reflux Disease

Gastric oesophageal reflux disease is a medical condition marked by the expelling of the contents of the stomach through the oesophagus. The incompetence of the sphincters in the junction between the oesophagus and the stomach is the cause of most cases of gastro-oesophageal reflux disease. The integrity of the sphincter is determined by the lower oesophageal sphincter and the crural diaphragm. When the sphincter has lost its integrity, the contractions of the stomach lead to increased stomach pressure in relation to the pressure on the oesophagus, causing the expelling of acidic gastric into the oesophagus. Corrosion and irritation of the oesophageal mucosa by the acid can lead to oesophageal inflammation and alteration of motility (Badillo, 2014).

Pathophysiology Of Peptic Ulcer Disease

Peptic ulcer disease is a condition that presents as breaks in the lining epithelium of the lower oesophagus, the stomach, or the upper portion of the intestines. The causes of peptic ulcer disease include the presence of the bacteria H. Pylori, excessive acid production, use of drugs that affect mucous production and other protective functions of the stomach, especially NSAIDS, and other inborn disorders like Crohn’s disease. Treatment protocols include treating the root cause of the

epithelial ulcerations. Treating the bacteria H. Pylori and administration of drugs aimed at reducing the acid production of the stomach, like proton inhibitors, are some of the treatment approaches used in peptic ulcer disease (Hussain, 2014).

Pathophysiology Of Gastritis

Gastritis is the inflammation of the lining of the stomach. The inflammatory process can be due to several factors, including hypersecretion of gastric acid, the presence of H. Pylori bacteria in the GIT, and the use of NSAIDs. The condition presents as pain in the upper abdominal section. Diagnosis of the condition and the isolation of the cause forms part of the treatment programme. In order to avoid the risk of developing peptic ulcers, part of the treatment should include the use of anti-acids and other acid-production inhibitors. In the case of H. Pylori infection, eradication of the bacteria forms a crucial part of treatment (Sipponen, 2015).

The Contribution Of Age To The Pathophysiology Of GERD, PUD, And Gastritis

The age of the patient is crucial in the diagnosis and management of GERD, PUD, and gastritis. The basis of age considerations for the possible causes of the clinical presentation may be helpful in hinting at the possible cause of the condition. The cases are more prevalent in older patients with a larger plethora of causes when compared to the younger patients. When taking the history of the patient, the inclusion of several segments, like alcohol consumption history, is crucial in adult patients. The contribution of NSAIDS in the development of PUD and gastritis is also higher in the older population (Kohata, 2016).

It is crucial o have in mind that older patients will have possible causes of gastrointestinal conditions. The diagnosis of possible causes of GERD, PUD, and gastritis has to incorporate all the possible laboratory tests, including diagnostic imaging, the use of confirmatory tests for specific differentials such as the urea breath test for H. Pylori, and stool exam.

Treatment options for GERD include the use of drugs that reduce gastric acid secretion. The use f correction anti-reflux surgery may also prove helpful in some patients especially those that have significant sphincter incompetence. Dose titration is important in different patients. Lower doses are used in young patients and the elderly due to the possibility of toxicity and reduced drug metabolism and excretion.

Diagnosis of gastritis is based on the history as presented by the patient and the use of other diagnostic tools like X-rays, blood tests, endoscopy, stool exam, and stomach lining biopsy.

Treatment of peptic ulcers and gastritis is also caused by dependent. Isolating the cause of the

clinical picture forms the first step of the management process. Dose titration of the drugs used in treatment is also crucial, depending on the age of the patient. The drugs used in the management of gastritis include antacids and mucosal protective agents. Reducing the acid concentration in the stomach helps restore the inflamed tissue to normalcy easily with reduced chances of complications.

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