

# **"Epidemiological evaluation and drug utilization pattern of the drugs used in Peptic ulcer"**

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Certified that this project report  
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utilization pattern of the drugs used in Peptic  
ulcer”** is the bonafied work of **“VISHAL  
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## **ABSTRACT**

In the present study drug utilization pattern of drugs used peptic ulcer patients was evaluated. The evaluation was done through online survey which was conducted in month of April 2021. The data of 63 patients were evaluated. It was concluded that the occurrence of peptic ulcer can take place at any age. It was also observed that allopathic drugs were more preferred than herbal drugs. The prevalence of disease is more in males as compared to females. On the basis of study it was concluded that 25.4% people take 5-7 days to recover from peptic ulcer. Patients who were taking this medicine suffer from other disease like cancer, infertility, respiratory diseases, malaria etc. Nearly 55% of people prefer combination therapy as compared to MONOTHERAPY.

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## **INTRODUCTION**

### **1.1 Peptic Ulcer**

Peptic ulcer disease refers to painful sores or ulcers in the lining of the stomach or first part of the small intestine, called the duodenum. Peptic ulcer disease (PUD), also known as a peptic ulcer or stomach ulcer, is a break in the lining of the stomach, First part of the small intestine, or occasionally the lower esophagus .An ulcer in the stomach is known as a gastric ulcer while that in the first part of the intestines is known as a duodenal ulcer. The most common symptoms are waking at night with upper abdominal pain or upper abdominal pain that improves with eating. The pain is often described as a burning or dull ache. Other symptoms include belching, vomiting, weight loss, or poor appetite. About a third of older people have no symptoms.

Complications may include bleeding, perforation, and blockage of the stomach. Bleeding occurs in as many as 15% of people. Peptic ulcers are present in around 4% of the population. They newly began in around 53 million people in 2014. About 10% of people develop a peptic ulcer at some point in their life. They resulted in 301,000 deaths in 2013 down from 327,000 deaths in 1990. The first description of a perforated peptic ulcer was in 1670 in Princess Henrietta of England. *H. pylori* was first identified as causing peptic ulcers by Barry Marshall and Robin Warren in the late 20th century, a discovery for which they received the Nobel Prize in 2005.<sup>1</sup>

### 1.1.1 SIGN & SYMPTOMS

The most common causes of peptic ulcers are infection with the bacterium *Helicobacter pylori* (*H. pylori*) and long-term use of aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) (Advil, Aleve, others). Stress and spicy foods do not cause peptic ulcers. However, they can make your symptoms worse.

- Burning stomach pain
- Feeling of fullness, bloating or belching
- Fatty food intolerance
- Heartburn
- Nausea
- Vomiting or vomiting blood — which may appear red or black

- Dark blood in stools, or stools that is black or tarry
- Trouble breathing
- Feeling faint
- Nausea or vomiting
- Unexplained weight loss
- Appetite changes

### 1.1.2 CAUSES

Most ulcers are caused by an infection with a type of bacteria called *Helicobacter pylori* (*H. pylori*). Factors that can increase your risk for ulcers include:

- Use of painkillers called non-steroidal anti-inflammatory drugs (NSAIDs), such as aspirin, naproxen (Aleve, Anaprox, Naprosyn, and others), ibuprofen (Motrin, Advil, some types of Midol, and others), and many others available by prescription; even safety-coated aspirin and aspirin in powdered form can frequently cause ulcers.
- Excess acid production from gastrinomas, tumors of the acid-producing cells of the stomach that increases acid output
- Excessive drinking of alcohol
- Smoking or chewing tobacco
- Serious illness
- Radiation treatment to the area

An ulcer may or may not have symptoms. When symptoms occur, they may include:

A gnawing or burning pain in the middle or upper stomach between



meals or at night

- Bloating
- Heartburn
- Nausea or vomiting

In severe cases, symptoms can include:

- Dark or black stool (due to bleeding)
- Vomiting blood (that can look like “coffee-grounds”)
- Weight loss
- Severe pain in the mid to upper abdomen though ulcers often heal on their own, you shouldn’t ignore their warning signs. If not properly treated, ulcers can lead to serious health problems, including:

- Bleeding
- Perforation (a hole through the wall of the stomach)
- Gastric outlet obstruction from swelling or scarring that blocks the passageway leading from the stomach to the small intestine taking NSAIDs can lead to an ulcer without any warning. The risk is especially concerning for the elderly and for those with a prior history of having peptic ulcer disease. Following are the conditions in which probability is more you may be more likely to develop ulcers if you:

- Are infected with the H. pylori bacterium
- Take NSAIDs such as aspirin, ibuprofen, or naproxen
- Have a family history of ulcers
- Have another illness such as liver, kidney, or lung disease.
- Drink alcohol regularly

- Are age 50 or older.<sup>2</sup>

### 1.1.3 MEDICATIONS

#### **1. Antibiotic medications to kill H. pylori.**

If H. pylori is found in your digestive tract, your doctor may recommend a combination of antibiotics to kill the bacterium. These may include amoxicillin (Amoxil), clarithromycin (Biaxin), metronidazole (Flagyl), tinidazole (Tindamax), tetracycline (Tetracycline HCL) and levofloxacin (Levaquin).

#### **2. Medications that block acid production and promote healing.**

Proton pump inhibitors — also called PPIs — reduce stomach acid by blocking the action of the parts of cells that produce acid. These drugs include the prescription and over-the-counter medications omeprazole (Prilosec), lansoprazole (Prevacid), rabeprazole (Aciphex), esomeprazole (Nexium) and pantoprazole (Protonix).

#### **3. Medications to reduce acid production.**

Acid blockers — also called histamine (H-2) blockers — reduce the amount of stomach acid released into your digestive tract, which relieves ulcer pain and encourages healing.

#### **4. Antacids that neutralize stomach acid.**

Your doctor may include an antacid in your drug regimen. Antacids neutralize existing stomach acid and can provide rapid pain relief. Side effects can include constipation or diarrhea, depending on the main ingredients.

#### **5. Medications that protect the lining of your stomach and small intestine.**

In some cases, your doctor may prescribe medications called cytoprotective agents that help protect the tissues that line your stomach and small intestine. Options include the prescription medications sucralfate (Carafate) and misoprostol (Cytotec).<sup>3</sup>

#### 1.1.4 PATHOPHYSIOLOGY

Peptic ulcers are defects in the gastric or duodenal mucosa that extend through the muscularis mucosa. The epithelial cells of the stomach and duodenum secrete mucus in response to irritation of the epithelial lining and as a result of cholinergic stimulation.

#### **H. pylori**

*Helicobacter pylori* is one of the major causative factors of peptic ulcer disease. It secretes urease to create an alkaline environment, which is suitable for its survival. It expresses blood group antigen adhesin (BabA) and outer inflammatory protein adhesin (OipA), which enables it to attach to the gastric epithelium. The bacterium also expresses virulence factors such as CagA and PicB, which cause stomach mucosal inflammation. The VacA gene encodes for vacuolating cytotoxin, but its mechanism of causing peptic ulcers is unclear. Such stomach mucosal inflammation can be associated with hyperchlorhydria (increased stomach acid secretion) or hypochlorhydria (reduced stomach acid secretion). Inflammatory cytokines inhibit the parietal cell acid secretion. *H. pylori* also secrete certain products that inhibit hydrogen potassium ATPase; activate calcitonin gene-related peptide sensory neurons, which increases somatostatin secretion to inhibit acid production by parietal cells; and inhibit gastric secretion. This reduction in acid production causes gastric ulcers. On the other

hand, increased acid production at the pyloric antrum is associated with duodenal ulcers in 10% to 15% of *H. pylori* infection cases. In this case, somatostatin production is reduced and gastric production is increased, leading to increased histamine secretion from the enterochromaffin cells, thus increasing acid production. An acidic environment at the antrum causes metaplasia of the duodenal cells, causing duodenal ulcers. Human immune response toward the bacteria also determines the emergence of peptic ulcer disease. The human IL1B gene encodes for Interleukin 1 beta, and other genes that encode for tumor necrosis factor (TNF) and Lymph toxin alpha also play a role in gastric inflammation.

## **NSAID**

Taking nonsteroidal anti-inflammatory drugs (NSAIDs) and aspirin can increase the risk of peptic ulcer disease by four times compared to non-users. The risk of getting peptic ulcer is two times for aspirin users. Risk of bleeding increases if NSAIDs are combined with selective serotonin reuptake inhibitor (SSRI), corticosteroids, antimineralocorticoids, and anticoagulants. The gastric mucosa protects itself from gastric acid with a layer of mucus, the secretion of which is stimulated by certain prostaglandins. NSAIDs block the function of cyclooxygenase 1 (COX-1), which is essential for the production of these prostaglandins. Besides this, NSAIDs also inhibit stomach mucosa cells proliferation and mucosal blood flow, reducing bicarbonate and mucus secretion, which reduces the integrity of the mucosa. Another type of NSAIDs, called COX-2 selective anti-inflammatory drugs (such as celecoxib), preferentially inhibit COX-2, which is less essential in the gastric mucosa. This reduces the

probability of getting peptic ulcers; however, it can still delay ulcer healing for those who already have a peptic ulcer.

### **Stress**

Stress due to serious health problems, such as those requiring treatment in an intensive care unit, is well described as a cause of peptic ulcers, which are also known as stress ulcers. While chronic life stress was once believed to be the main cause of ulcers, this is no longer the case. It is, however, still occasionally believed to play a role. This may be due to the well-documented effects of stress on gastric physiology, increasing the risk in those with other causes, such as *H. pylori* or NSAID use.

### **Diet**

Dietary factors, such as spice consumption, were hypothesized to cause ulcers until the late 20th century, but have been shown to be of relatively minor importance. Caffeine and coffee, also commonly thought to cause or exacerbate ulcers, appear to have little effect. Similarly, while studies have found that alcohol consumption increases risk when associated with *H. pylori* infection, it does not seem to independently increase risk. Even when coupled with *H. pylori* infection, the increase is modest in comparison to the primary risk factor.

### **Other**

Other causes of peptic ulcer disease include gastric ischaemia, drugs, metabolic disturbances, cytomegalovirus (CMV), upper abdominal radiotherapy, Crohn's disease, and vacuities. Gastrinomas (Zollinger–Ellison syndrome), or rare gastrin-secreting tumors, also cause multiple and difficult-to-heal ulcers. It is still unclear if smoking

increases the risk of getting peptic ulcers.<sup>4</sup>

#### **1.1.4 DIAGNOSIS**

Peptic ulcer disease is suspect in patients with epigastric distress and pain; however, these symptoms are not specific. Lack of response to conventional treatment for peptic ulcer disease should suggest conditions other than benign peptic ulcers, and should warrant endoscopy or abdominal imaging.

##### **Radiological Diagnosis**

Barium x-ray or upper GI series is a widely available and accepted method to establish a diagnosis of peptic ulcer in the stomach. Though less invasive than endoscopy, the barium x-ray is limited by being less sensitive and accurate at defining mucosal disease, or distinguishing benign from malignant ulcer disease. In patients who have anatomic deformities from previous gastric surgery or scarring from chronic inflammation, barium x-rays may be difficult to interpret. Generally, these x-rays have up to a 30% false negative and a 10% false positive rate. Until 1970, peptic ulcers were diagnosed almost exclusively by radiological methods. The most common inaccuracies of radiological diagnosis include the failure to recognize true ulcers, or the misdiagnosis of a scar or a deformed duodenal bulb as a true ulcer. Since the 1970s, increasing numbers of peptic ulcers are diagnosed.

##### **Laboratory Testing**

<sup>14</sup>C-labeled urea and an exhaled breath is sampled for isotope-labeled

CO<sub>2</sub> released by intragastric *H. pylori* urease activity. The test can be completed within 20 and IgA ELISA tests (enzyme-linked immunosorbent assay) are significantly higher in gastric antrum, obtained during endoscopy, is the gold standard for diagnosis of *H. pylori*-positive than in *H. pylori*-negative patients. Sensitivity of this serum assay *Helicobacter pylorus* (*H. pylori*) infection. Histological examination of biopsies of the is generally in the range of 80–95% and specificity in the range of 75–95%. minutes and is highly sensitive and specific.

More recently, stool antigen testing has emerged as an alternative non-invasive means of detecting the presence of *H. pylori*. These fecal assays have become a useful test, and recent studies have shown a sensitivity value of 94% with specificity between 86- 92%. Furthermore, it may be used to easily document eradication of an *H. Pylori* infection if performed at least four weeks after treatment. Organism. Serologic tests are available, but unfortunately, positive test results indicate only past exposure and are not useful for determining if the infection has been cured. Patients who respond to optimal therapy for peptic ulcer disease do not require Patients with refractory or recurrent peptic ulcer disease may have an underlying *pylori* infection. Because *H. pylori* produces large quantities of the enzyme urease, *pylori*. Routinely, *H. pylori* is not cultured because of the difficulty growing the Serologic testing is an accepted method for detection of *H. pylori*. Mean levels of IgG specialized testing. However, those with refractory (not healed after 8 weeks of therapy) or recurrent disease should have serum gastric and serum calcium measured to screen for gastrinoma and multiple endocrine neoplasia (MEN). These patients should also undergo gastric acid analysis to determine whether the ulcer is caused by gastric acid hypersecretion

(basal acid output exceeding 10 mEq/hr) or decreased mucosal protection. These breath tests have the potential to be quite useful. <sup>13</sup>C- and <sup>14</sup>C-urea breath tests offer excellent diagnostic yield. Patients ingest a solution containing <sup>13</sup>C- or Urea breath tests are simple and non-invasive, and have been used to diagnose H.

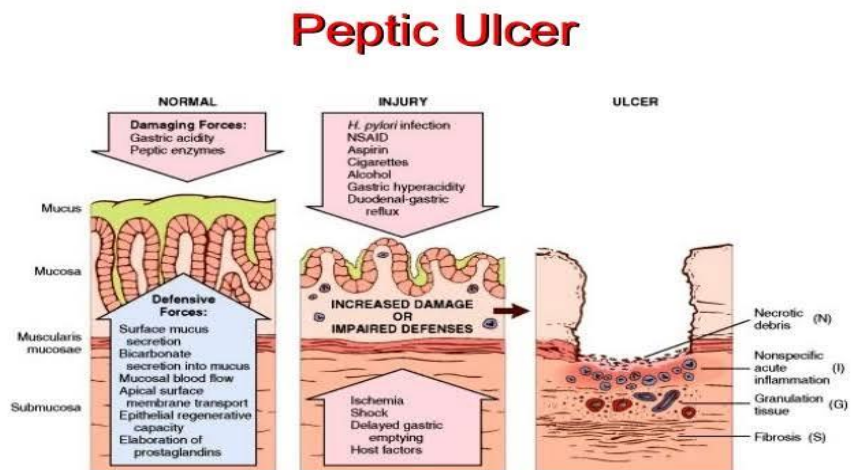
### **Endoscopic Diagnosis**

Gastrointestinal endoscopy allows the physician to visualize and biopsy the upper gastrointestinal tract including the esophagus, stomach and duodenum. The enteroscope (a longer endoscope) allows visualization of at least 50% of the small intestine, including most of the jejunum and different degrees of the ileum. During these procedures, the patient is given a numbing agent to help prevent gagging. Pain medication and a sedative may be administered prior to the procedure. The patient is placed in the left lateral position.

An endoscope (a thin, flexible, lighted tube) is passed through the mouth and pharynx and into the esophagus. The forward-viewing scope transmits an image of the esophagus, stomach and duodenum to a monitor visible to the physician. Air may be introduced into the stomach, expanding the folds of tissue, and enhancing examination of the stomach. Esophagogastroduodenoscopy (EGD) is the most direct and most accurate method of establishing the diagnosis of peptic ulcer disease. In addition to identifying the ulcer, its location and size, EGD also provides an opportunity to detect subtle mucosal lesions and to biopsy lesions to establish histopathological basis. Endoscopic biopsies are indicated for all gastric ulcers at the time of diagnosis, whereas duodenal ulcers are almost always benign, not requiring biopsy in usual circumstances. Endoscopic biopsy also



appears the best and most accurate diagnostic method for *H.pylori*. Histological examination with standard haematoxylin and eosin staining provides an excellent means of diagnosis. In an effort to speed up the diagnosis of *H. pylori* following a biopsy of the gastric mucosa, urease activity has been used. Biopsy specimens are placed in a urea and phenol red solution or gel. If urease from *H. pylori* is present in the specimen, urea is hydrolyzed to release ammonia, increasing pH in the solution and giving a pink color to the gel or solution. At 3 hours, this test has a sensitivity of 90%. Using this technique, the diagnosis can be made sooner than standard



histopathological.<sup>5</sup>

## 1.1.6 TREATMENT

### Overview

Most peptic ulcers heal if gastric acid production is adequately suppressed. The rationale behind the treatment of peptic ulcer disease is twofold. The reduction of hostile a factor is essential, as is augmentation of protective factors. Antacids, histamine H<sub>2</sub>-receptor antagonists, proton pump inhibitors (e.g., omeprazole, lansoprazole), and surgery succeed by neutralization or reduction of gastric acid.

Sucralfate and prostaglandin agents boost mucosal protection. The eradication of *H. pylori* infection restores normal mucosal resistance, but unlike other treatment options, does not require maintenance therapy to prevent ulcer recurrence. Patients should avoid factors known to contribute to peptic ulcer disease, such as NSAIDs and smoking.

### **Medical Therapy**

The goal of therapy for peptic ulcer disease is to relieve symptoms, heal craters, prevent recurrences, and prevent complications. Medical therapy should include treatment with drugs, and attempt to accomplish the following: 1) reduce gastric acidity by mechanisms that inhibit or neutralize acid secretion, 2) coat ulcer craters to prevent acid and pepsin from penetrating to the ulcer base, 3) provide a prostaglandin analog, 4) remove environmental factors such as NSAIDs and smoking, and 5) reduce emotional stress (in a subset of patients). Antacids neutralize gastric acid and are more effective than placebo in healing gastric and duodenal ulcers. However, antacids have to be taken in relatively large doses 1 and 3 hours after meals and at bedtime, and may cause side effects. The major side effect of magnesium-containing antacids is diarrhea caused by magnesium hydroxide. Histamine H<sub>2</sub>-receptor antagonists reduce gastric acid production by blocking the H<sub>2</sub> receptor on the parietal cell. Examples of available H<sub>2</sub> blockers used to treat gastric and duodenal ulcers include cimetidine, ranitidine, famotidine and nizatidine. This group of compounds effectively decreases acid secretion. H<sub>2</sub>-receptor antagonists are relatively safe. The choice of drug should be dictated by cost, dosing schedule, convenience, and possible drug interactions. The family of drugs known as proton

pump inhibitors, or PPIs, inactivate the parietal cell hydrogen-potassium ATPase located on the luminal surface. ATPase acts as a proton pump and constitutes the final common pathway in the secretion of hydrogen ions. This class of medicines is now considered the gold standard in medical therapy of peptic ulcer disease. Examples of available PPIs include omeprazole, lansoprazole, pantoprazole, rabeprazole, and esomeprazole. Increasing the PPI dose can reduce acid secretion to the point of achlorhydria (unachievable by H<sub>2</sub> blockade). Thus, the proton pump inhibitors are the primary treatment when gastric hypersecretion is resistant to other therapies. Proton pump inhibitors have been shown to prevent NSAID-associated gastro duodenal ulcers, and to provide a safe and effective form of therapy. Furthermore, studies have shown that PPIs are more effective than H<sub>2</sub>-receptor antagonists at treating all types of peptic ulcer Disease. Sucralfate is the aluminum salt of a sulfated disaccharide. The drug forms a barrier or coating over the ulcer crater, stimulates prostaglandin synthesis, and binds to noxious agents such as bile salts. Although the exact mechanism of action is unclear, it appears sucralfates stimulate prostaglandins, which promote improved mucosal integrity and enhance epithelial regeneration. Because it requires multiple doses per day, patients are less likely to follow a sucralfate regimen even though it has been shown to be as effective as an H<sub>2</sub> blocker in healing both duodenal and gastric ulcers. Sucralfate is not absorbed systemically, and its only remarkable side effect is constipation. Misoprostol is a prostaglandin E<sub>1</sub> analog that increases mucosal resistance and inhibits acid secretion to a minor degree. Misoprostol has been advocated for prophylaxis of NSAID-induced mucosal injury. The drug has significant side effects, primarily mild to moderate diarrhea, and is too costly to be used by most patients.

on long-term NSAIDs. The suppression of gastric acid production promotes the healing of peptic ulcers. Unfortunately, if acid suppression therapy is not maintained, peptic ulcers regularly recur. Since the long-term cure of peptic ulcers accompanies the eradication of *H. pylori*, all ulcers associated with this infection should be treated with the aim of infection eradication. Although *H. pylori* is sensitive to a variety of antibiotics in vitro, its habitat beneath the gastric mucosa makes it difficult to treat. The original treatment gold standard was 2 weeks of triple therapy, including bismuth, tetracycline or amoxicillin, and metronidazole. Where compliance with this regimen can be assured, *H. pylori* cure rate is 90–95% or more; however, 20% of these cases develop side effects. Newer simpler regimens have been developed and *H. pylori* treatment recommendations are still evolving. Today, the current gold standard of therapy is a triple combination of drugs that includes a PPI (e.g. omeprazole or lansoprazole) plus amoxicillin and a newer antibiotic, clarithromycin. All three medicines are to be taken twice per day for 7-14 days (preferably 14 days). Alternative drugs may be offered to those patients with certain allergies or medication intolerances. Physicians should always offer patients with peptic ulcer disease and confirmed *H. pylori* infection the option of curative therapy.

Gastric ulcers should be re-evaluated by multiple endoscopic biopsies and cytology to rule out gastric carcinoma if they have not healed after 8 weeks of conventional medical therapy. If no malignancy is seen on biopsy, aggressive treatment should be instituted for 6 weeks to eradicate *H. pylori* and to suppress acid with full doses of a proton pump inhibitor. A gastric ulcer that does not heal after this second aggressive course of medical therapy may suggest underlying malignancy, even with negative repeat biopsies. Non-healing gastric

ulcers should be resected surgically.<sup>6</sup>

### **Surgical Therapy**

Over the past few decades in the United States, we have witnessed a declining need for surgery to treat peptic ulcer disease. This decline may be explained primarily by the widespread use of H<sub>2</sub> receptor antagonists, and now more recently, proton pump inhibitors. Complications such as gastrointestinal hemorrhage, perforation, or gastric outlet obstruction remain the major indications for surgical intervention. The most common reason for surgical intervention for benign gastric ulcers is failure of the ulcer to completely heal after an adequate trial of medical or endoscopic therapy. Patients are usually given a 6-month trial of antisecretory agents prior to surgical consultation. The major concern regarding non-healed ulcers is the high risk of underlying malignancies. Due to the benign nature of duodenal ulcers, physicians can monitor the patients' response to medical regimens by following their symptoms. When patients with duodenal ulcers require surgery, it is usually one of three procedures: vagotomy, vagotomy with antrectomy, or subtotal gastrectomy. Vagotomy alone (without gastric resection) may involve truncal vagotomy with drainage, selective vagotomy with drainage, or proximal gastric vagotomy alone (without a drainage procedure). Delayed gastric emptying may be caused by truncal vagotomy, and a concurrent drainage procedure such as antrectomy, pyloroplasty, or gastroenterostomy may be necessary as antral innervation (by Latarjet nerves) is nonfunctioning. Selective vagotomy (proximal gastric vagotomy) does not necessitate a concomitant drainage procedure. Morbidity resulting from the surgical procedure and the risk of recurrence of ulcers are two major considerations. Proximal gastric

vagotomy is probably the morbidity resulting from the surgical procedure and the risk of recurrence of ulcers are two major considerations. Proximal gastric vagotomy is probably the most preferred of surgical options because the pylorus is preserved. Recurrence of ulcer disease is about the same with all three types of surgical procedures, however, the incidence of dumping symptoms is higher with vagotomy or vagotomy with antrectomy.

When endoscopic hemostasis techniques are unavailable or fail to resolve bleeding or recurrent hemorrhage, surgery provides another therapeutic option. Surgery is effective in the prevention of recurrent ulceration and in excluding the presence of malignant disease. Emergent surgery has a higher mortality rate than elective surgery, and resection procedures are accompanied by higher mortality than over sewing the ulcer and selective vagotomy, or vagotomy and pyloroplasty. The operative choice is related to the surgeon's experience, ulcer location, and overall condition of the patient. Truncal vagotomy and antrectomy provide high cure rates and low recurrence rates. Recurrence rates after vagotomy and pyloroplasty are somewhat higher. Laparoscopic selective vagotomy provides an appealing alternative for a subset of ulcer patients with lower morbidity, shorter recovery time, and a shorter hospital stay.

### **Injection Therapy**

Injection therapy for upper gastrointestinal bleeding is inexpensive, simple and widely used. A sclerotherapy catheter with a small retractable needle is passed through the biopsy channel of the endoscope. Non-bleeding visible vessels are treated by the injection of a solution at three or four surrounding sites about 1-3 mm from the vessel. Subsequently, the visible vessel is injected. In cases of

bleeding vessels, injections are made around the bleeding point until hemostasis is achieved.

This is followed by injection into the vessel. Several different sclerosant agents have been used alone or in combination to achieve endoscopic hemostasis. Adrenaline; hypertonic saline and adrenaline combined; adrenaline and polidocanol; pure ethanol; or combinations of dextrose, thrombin, and sodium morrhuate have shown improvement in rebleeding, the need for urgent surgery, and mortality.

Combined injection and thermal treatment have theoretical advantages in the treatment of bleeding ulcers. Injection with epinephrine produces vasoconstriction and activates platelet coagulation, reducing blood flow and potentiating thermal therapy, which produces coaptive coagulation. Recent studies have shown combination therapy (epinephrine injection and heater probe) benefited patients with spurting bleeding, but not those with oozing bleeding.

### **Mechanical Therapy**

Endoscopic hemoclips have recently been developed and made their way to the scene of endoscopic therapy for peptic ulcer disease. These devices are small 3-4 mm titanium clips that can be opened and closed while being operated through the working channel of the endoscope. They may be used to pinch-off, or clip, a bleeding vessel. When fully deployed, they remain fastened to the vessel after the endoscope has been removed from the patient. Emerging studies have shown that hemoclips are an effective and safe method for treating certain forms of peptic ulcer disease and should be used in the appropriate setting.

### **Radiological Therapy**

Angiography is a useful diagnostic and therapeutic modality in treatment of bleeding gastric and duodenal ulcers. Angiography can identify the site of bleeding in instances where endoscopy has failed to be diagnostic. It should also be considered in patients at high risk for surgical intervention.

Angiographic therapy includes two different embolization techniques for the treatment of GI bleeding. Effective in 50% of cases, vasopressin intra-arterial infusion causes vasoconstriction that results in the cessation of ulcer hemorrhage. Embolic material such as an absorbable gelatin sponge, tissue adhesives, or other occlusion devices (such as micro coils) can be inserted through a catheter into the area of bleeding. Potential complications of embolization therapy may include ischemia and perforation.<sup>7</sup>

## **1.2 DRUG UTILIZATION PATTERN**

Drug utilization research as defined by WHO in 1977 is 'the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences'. It provides information about pattern, quality and outcome of drug use. Pattern of drug utilization is studied to estimate the incidence and prevalence of drug use, to analyze that the recommended guidelines for prescription are being followed or not.

The aim of drug utilization study is to promote rational and appropriate use of drugs at lowest possible dose and cost. WHO has specified prescribing indicators, patient care indicators, facility indicators and complementary indicators for planning and conducting drug utilization studies.

To compare, analyze and present statistical data of drug utilization



research, the anatomical and therapeutic chemical (ATC) classification systems is accepted worldwide and also recommended by WHO. It is used by international drug monitoring centre Upssala, a WHO collaborating centre for classification of ADRs. Defined daily dose is average maintenance dose per day and used as a comparable unit. Prescribed daily dose (PDD) may not be equal to DDD. It is a rough estimate of drug utilization.

Rational prescribing of drugs is a skill, for which proper knowledge about drugs, pharmacoconomics, pharmacovigilance and experience is mandatory. If the drugs are overused, they increase occurrence of toxic reactions, if underused, there will be therapeutic failure and Chances of development of resistant strain to antibiotics, if misused will lead to unnecessary adverse drug effects and drug interactions.

Very few studies are available nationally and internationally which have observed drug utilization in indoor patients of general medicine and no study is available from Rajasthan. So present study was planned to develop a baseline prescription pattern, to evaluate prescription as per WHO quality indicators, apply ATC classification and cost analysis of prescribed drugs in indoor patients of medicine department of a tertiary care teaching institute in southern Rajasthan.

**Drug utilization studies** aim to evaluate factors related to the prescribing, dispensing, administering and taking of medication, and its associated events (either beneficial or adverse). Since the early 1960's the interest in Drug Utilization Studies has been increasing, first with market-only purposes, then for evaluating the quality of medical prescription and comparing patterns of use of specific drugs. Presently drug utilization studies are an evolving area. Their scope is to evaluate the present state and future trends of drug usage, to estimate crudely disease prevalence, drug expenditures, appropriateness of

prescriptions and adherence to evidence-based recommendations. The increasing importance of drug utilization studies as a valuable investigation resource in pharmacoepidemiology has been bridging it with other health related areas, such as public health, pharmacovigilance, pharmacoconomics, eco-pharmacovigilance or pharmacogenetics.

Drug utilization research has been defined by the World Health Organization (WHO) in 1977 as 'study of marketing, distribution, prescription, and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences.' Drug utilization research may provide insights into different aspects of drug use and drug prescribing, such as pattern of use, quality of use, determinants of use, and outcome of drug use. Drug utilization is an important component of many research initiatives that examine the clinical and economic effectiveness of pharmacotherapy. Monitoring medication use and knowledge of prescription habits are some of the strategies recommended for containing and controlling medication cost and its effect on the national budget.

Considering the physiological changes that occur with aging and its impact on the pharmacokinetics and pharmacodynamics of drugs, it is essential to monitor drug effects, especially adverse drug reactions (ADR) and drug interactions, vis-a-vis clinical outcome in geriatric patients. To understand these processes better and in order to make the drug use rational and safer, it is necessary to study the pattern of drug use in geriatric patients. As the number of medicines taken by geriatric patients and the incidence of ADR is more in this age-group, it becomes increasingly important to study patterns of drug use. Very few studies on drug utilization in geriatric patients are available and, to the best of our knowledge, no such study has been

conducted in India so far. For these reasons we undertook the present study with the broad aim of understanding the pattern of drug use in geriatric patients and the influence of factors like age, gender, education status, socioeconomic status, etc. on drug prescribing in geriatric patients.

The anatomical therapeutic chemical classification (ATC) / defined daily dose (DDD) system is a tool for presenting drug utilization research in order to improve quality of drug use and is recommended by the WHO as the international standard for drug utilization studies. One component of this system is presentation and comparison of drug consumption statistics at international and other levels. The DDD is an artificially and arbitrarily created statistical measurement used for research purposes when comparing the utilization of drugs. The formal definition of the DDD is 'the assumed average maintenance dose per day for a drug used for its main indication in adults.' DDD are assigned only to drugs that have already been provided with an ATC code. The DDD methodology was developed in response to the need for converting and harmonizing readily available volume data (bulk costs and prescriptions) from supply statistics of pharmacy inventory data into medically meaningful units; it allows us to make crude estimates of the number of persons exposed to a particular drug or class of drugs.<sup>8</sup> The aim of this descriptive study was to analyze general medication utilization patterns in geriatric patients in a rural tertiary care teaching hospital.

The World Health Organization (WHO) defines drug utilization research as “the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences” [1]. Thus, inherent in the definition, such studies provide logical background for determining the rationality of

drug use as well as providing evidence based guidance for making policy decisions at various levels of healthcare. Drug utilization research studies conducted in the inpatient settings are effective tools that help in evaluating the drug prescribing trends, efficiency, and cost-effectiveness of hospital formularies. There is always a variation in drug utilization among different countries and even among health institutions within a country and sometimes within the same institute at different point of time probably because of changing disease trends over a period of time [2]. Conducting periodic studies of pattern of drug use in various hospital settings or patient populations is therefore essential to critically analyse the current hospital drug policies and to make recommendations based on various guidelines to improve upon the current drug usage pattern in the future, if needed. This is more importantly required in resource poor countries like ours so as to ensure that the scarce resources are utilized in the best possible manner. Though there have been various drug utilization studies conducted on specific populations and in varied settings in India [3, 4], only a few have been conducted in emergency settings [5–7]. Previous studies conducted by the authors in our hospital emergency department were primarily safety utilization studies [8, 9]. The emergency department represents an important platform for conducting drug utilization studies as patients present with a wide range of diseases in acute form and the drug use is quite extensive. Therefore, evaluating the drug prescribing behaviour and usage patterns in the emergency settings has the potential of determining the rationality of drug therapy being given in the particular region to a broader extent. Keeping this in view, we conducted a drug utilization study in our tertiary care hospital with the objective of studying pattern of drug use and cost of drug treatment and determining the

rationality of prescriptions so as to identify priority areas that need to be targeted for further improvement in patient care.

The most prescribed drug was ranitidine: 0.97 – 0.25 DDD/1000 inhabitants/day, while the consumption of omeprazole is 0.18 -0.19 DDD/1000 inhabitants/day respectively 2004-2014. The reimbursement scheme provides a quite poor coverage of necessary alternatives of the proton pump inhibitors that are used for the treatment of the ulcerous disease. The reimbursement scheme offers only omeprazole. However, the consumption of omeprazole under the scheme is in much lower levels compared to the real data of omeprazole consumption coming from import figures. On the other hand, a consistent part of the sales of omeprazole is out-of-pocket expenditure. Acid suppression is the general pharmacologic principle of medical management of acute bleeding from a peptic ulcer, using histamine-2 receptor antagonists (H<sub>2</sub>RAs) and proton pump inhibitors (PPIs). Both classes are available in intravenous or oral preparations. Discontinuation of NSAIDs is paramount, if it is clinically feasible. For patients who must continue with their NSAIDs, PPI maintenance is recommended to prevent recurrences even after eradication of *H pylori*.

The recommended primary therapy for *H pylori* infection is proton pump inhibitor (PPI)-based triple therapy. Antacids or a GI cocktail (typically an antacid with an anesthetic such as viscous lidocaine and/or an antispasmodic) may be used as symptomatic therapy in the ED. Maintenance treatment with antisecretory medications (e.g., H<sub>2</sub> blockers, PPIs) for 1 year is indicated in high-risk patients. High-risk patients include those with recurrent ulcers and those with complicated or giant ulcers. If *H pylori* eradication is not achieved despite repeat treatment, maintenance antisecretory therapy should be recommended.

Patients with refractory ulcers may continue receiving once-daily PPI therapy indefinitely. In this setting, if H pylori is absent, consider a secondary cause of duodenal ulcer, such as Zollinger-Ellison syndrome.<sup>9</sup>

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### **1.3 EPIDEMIOLOGICAL STUDY**

Epidemiology studies are conducted using human populations to evaluate whether there is a correlation or causal relationship between exposure to a substance and adverse health effects. These studies differ from clinical investigations in the individuals have already been administered the drug during medical treatment or have been exposed to it in the workplace or environment. Epidemiological studies measure the risk of illness or death in an exposed population compared to that risk in an identical, unexposed population (for example, a population the same age, sex, race and social status as the exposed population).

Epidemiology is the study of the distribution of diseases and other health-related conditions in populations, and the application of this study to control health problems. The purpose of epidemiology is to understand what risk factors are associated with a specific disease, and how disease can be prevented in groups of individuals; due to the observational nature of epidemiology, it cannot provide answers to what caused a disease to a specific individual. Epidemiologic studies can be used for many reasons, commonly to estimate the frequency of a disease and find associations suggesting potential causes of a disease. To achieve these goals, measures of disease (incidence) or death (mortality) are made within population groups. Epidemiology is fundamentally multidisciplinary and it uses knowledge from biology, sociology, statistics, and other fields.

Epidemiological studies can be divided into two basic types depending

on (a) whether the events have already happened (retrospective) or (b) whether the events may happen in the future (prospective). The most common studies are the retrospective studies which are also called case-control studies. A case-control study may begin when an outbreak of disease is noted and the causes of the disease are not known, or the disease is unusual within the population studied.

The first step in an epidemiological study is to strictly define exactly what requirements must be met in order to classify someone as a "case." This seems relatively easy, and often is in instances where the outcome is either there or not there (a person is dead or alive). In other instances it can be very difficult, particularly if the experts disagree about the classification of the disease. This happens often with the diagnosis of particular types of cancer. In addition, it is necessary to verify that reported cases actually are cases, particularly when the survey relies on personal reports and recollections about the disease made by a variety of individuals.

### **Common Statistical Measures**

Standard, quantitative measures are used to determine if epidemiological data are meaningful. The most commonly used measures are:

1. Odds Ratio (O/R) — the ratio of risk of disease in a case-control study for an exposed group to an unexposed group. An odds ratio equal to 2 ( $O/R = 2$ ) means that the exposed group has twice the risk as the non-exposed group.
2. Standard Mortality Ratio (SMR) — the relative risk of death based on a comparison of an exposed group to non-exposed group. A standard mortality ratio equal to 150 ( $SMR = 150$ ) indicates that there is a 50% greater risk.

3. Relative Risk (RR) — the ratio expressing the occurrence of disease in an exposed population to that of an unexposed population. A relative risk of 1.75 (RR = 1.75) indicates a 75% increase in risk.

### **1.3.1 TYPES OF EPIDEMIOLOGICAL STUDIES**

There are four primary types of epidemiology studies. They are:

1. **Cohort studies** — A cohort (group) of individuals with exposure to a chemical and a cohort without exposure are followed over time to compare disease occurrence.
2. **Case control studies** — Individuals with a disease (such as cancer) are compared with similar individuals without the disease to determine if there is an association of the disease with prior exposure to an agent.
3. **Cross-sectional studies** — The prevalence of a disease or clinical parameter among one or more exposed groups is studied, such as: The prevalence of respiratory conditions among furniture makers.
4. **Ecological studies** — The incidence of a disease in one geographical area is compared to that of another area, such as: Cancer mortality in areas with hazardous waste sites as compared to similar areas without waste sites.

### **Cohort Studies**

Cohort studies are the commonly conducted epidemiology studies and



they frequently involve occupational exposures. Exposed persons are easy to identify and their exposure levels are usually higher than in the general public. There are two types of cohort studies:

- Prospective, in which cohorts are identified based on current exposures and followed into the future.
- Retrospective, in which cohorts are identified based on past exposure conditions and study "follow-up" proceeds forward in time; data come from past records.<sup>10</sup>

## LITERATURE REVIEW

**Ghosh B C (2010)** investigated that Peptic ulcer disease affects nearly 4 million of global population yearly. Its Complications are reported approximately in 10–20% among the patients and ulcer perforation is noted in near about 2–3%.<sup>3,4</sup> Perforation of the peptic ulcer is the second most important and dreaded complication of peptic ulcer disease. In early decades of the twentieth century ulcer perforation incidence increased significantly, and there was an epidemic of ulcer perforations situated in the duodenum of middle-aged men.<sup>5,6</sup> Peptic ulcer disease includes perforation, bleeding, and obstruction. Although perforations are secondary to bleeding frequency (about 1:6 Ratio), they represent the most common indication for emergency surgical intervention or peptic ulcer. Imbalance between the protective and the ulcerogenic factors reported in ulcer formation process, the reasons why some patients' ulcers perforate and others do not is not understood. Development of ulcer involves infection (H. pylori), mucosal barrier injury (e.g. use of drugs), and increased production of hydrochloric acid. The precise risk estimates and contribution of each factor are still poorly understood.<sup>11</sup>

**Priti et al** investigated that Anti Peptic Ulcer Drugs (APUDs) like proton pump inhibitors, H<sub>2</sub>-receptor antagonists, antacids, synthetic prostaglandins, and cytoprotective agents are widely used nowadays and have changed the physicians' treatment patterns in general practice, gastroenterology as well as specialized clinics. The use of these drugs has been extended beyond prevention and treatment of peptic ulcers; to other disease and symptoms such as non-ulcer dyspepsia, heartburn, prevention of side effects caused by drugs, etc. APUD overuse is common and this is evident across all specialties, particularly in those

that commonly prescribe antiplatelet agents, nonsteroidal anti-inflammatory drugs (NSAIDs), steroids and anticoagulation medications. Recent concerns have arisen regarding the potential for adverse events involving long-term acid suppression.,, In spite of being popularly prescribed worldwide, only few studies documenting their utilization could be found in Asian countries [China, Malaysia, Saudi Arabia, India].<sup>12</sup>

**Robert T Cavitt. et al in 2019** investigated that Peptic ulcer disease continues to be a source of significant morbidity and mortality worldwide. Approximately two-thirds of patients found to have peptic ulcer disease are asymptomatic. Most cases of peptic ulcer disease are associated with *Helicobacter pylori* infection or the use of nonsteroidal anti-inflammatory drugs (NSAIDs), or both. In this review, we discuss the role of proton pump inhibitors in the management of peptic ulcer disease, highlight the latest guidelines about the diagnosis and management of *H. pylori*, and discuss the latest evidence in the management of complications related to peptic ulcer disease, including endoscopic intervention for peptic ulcer-related bleeding. Timely diagnosis and treatment of peptic ulcer disease and its sequelae are crucial in order to minimize associated morbidity and mortality, as is prevention of peptic ulcer disease among patients at high risk, including those infected with *H. pylori* and users of NSAIDs.<sup>13</sup>

**Jason W kempenich. et at** The management of peptic ulcer disease has radically changed over the last 40 years from primarily surgical treatment to medical therapy nearly eliminating the need for elective surgery in these patients. Although there has been a decline in patients

requiring acute surgical intervention for complications of peptic ulcer disease (perforation, bleeding, and obstruction), these patients still make up a significant proportion of hospital admissions every year. The modern acute care surgeon must have significant knowledge of the multiple treatment modalities used to appropriately care for these patients.<sup>14</sup>

**Yuhong yuan(1996)** found that Over the past few decades, since the introduction of histamine H<sub>2</sub>-receptor antagonists, proton-pump inhibitors, cyclo-oxygenase-2-selective anti-inflammatory drugs (coxibs), and eradication of *Helicobacter pylori* infection, the incidence of peptic ulcer disease and ulcer complications has decreased. There has, however, been an increase in ulcer bleeding, especially in elderly patients. At present, there are several management issues that need to be solved: how to manage *H. pylori* infection when eradication failure rates are high; how best to prevent ulcers developing and recurring in nonsteroidal anti-inflammatory drug (NSAID) and aspirin users; and how to treat non-NSAID, non-*H. pylori*-associated peptic ulcers. Looking for *H. pylori* infection, the overt or surreptitious use of NSAIDs and/or aspirin, and the possibility of an acid hypersecretory state are important diagnostic considerations that determine the therapeutic approach. Combined treatment with antisecretory therapy and antibiotics for 1-2 weeks is the first-line choice for *H. pylori* eradication therapy.<sup>15</sup>

**Kaur Amandeep** in 2012 stated that peptic ulcer is a sore on the lining of the stomach or duodenum. The two most common types of peptic ulcer are called “gastric ulcers” and “duodenal ulcers”. Peptic ulcers are found to be due to an imbalance between aggressive factors such as hydrochloric acid (HCL), pepsin, refluxed bile, leukotrienes (LTs), reactive oxygen species (ROS) and defensive factors, which include the function of the mucus-

bicarbonate barrier, prostaglandins (PGs), mucosal blood flow, cell renewal and migration, no enzymatic and enzymatic antioxidants and some growth factors. Also, a numbers of factors are implicated in the pathogenesis of gastric ulcer, among which major factors involved are bacterial infection (*Helicobacter pylori*), certain medications (NSAID), chemicals (Hcl/ethanol), gastric cancer and minor factors are stress, smoking, spicy food and nutritional deficiencies. The main aim of this review article has to summarize the ulcerogenic mechanisms of various mediators involved in Peptic ulcer disease.<sup>16</sup>

**Katherine J guthrie 1998**The occurrence of peptic ulcer in infancy was described over a hundred years ago by Cruveilhier (1829-35) in his *Anatomie Pathologique du Corps Humain*. He records the presence of multiple gastric ulcers in three infants at the respective ages of one, two, and four weeks. The lesions are clearly illustrated by drawings. Since then reports on peptic ulcers in children have appeared in ever-increasing numbers in the literature (chiefly continental and American), Thiele (1919a) having collected 248 cases under the age of sixteen, while Bird, Limper and Mayer (quoted Ladd and Gross, 1941) review 243 cases up to the age of fifteen. In this country, however, according to Paterson, only three British cases were published prior to 1922. Some authors, however, believe that the lesion may be present at birth. According to Ladd and Gross it has been described in stillborn infants. It is well known that acute peptic ulcers can develop very quickly, having been seen as early as nineteen hours after a severe burn (Hurst and Stewart, 1929). It is possible that in newborn infants with a very delicate gastrointestinal wall ulceration may progress still more rapidly: hence an intrauterine origin for ulcers need not be assumed even in infants dying shortly after birth.<sup>17</sup>

**Jose martin 2013** Equine gastric ulcer syndrome (EGUS) negatively impacts the equine industry by causing weightloss, unresponsive training, poor performance in the affected animals (Nieto et al., 2009) and incurring a high cost associated with the treatment. Additionally, EGUS causes discomfort and colic that may also lead to other gastrointestinal complications. EGUS affects horses of all breeds and ages. EGUS prevalence between 25 to 50% in foals and 80 to 90% in adult horses has been reported (Murray, 2009). Prevalence depends upon the stress level, welfare status related to sport or work activity, and food quality. Prevalence greater than 50% has been also reported in non-competing equines with normal clinical appearance (McClure et al., 2005; Videla and Andrews, 2009; Luthersson et al., 2009a). Due to the complexity, pathophysiology and triggering factors of EGUS, the treatment requires many strategies and long term care, both preventive and curative, thereby increasing treatment cost (Aranzales and Alves, 2013).

**Kourosh. Et At** Peptic ulcer is a prevalent problem and symptoms include epigastric pain and heartburn. This study aimed at investigating the prevalence and causes of peptic ulcers in Iran using systematic review and meta-analysis. Materials and Methods Eleven Iranian papers published from 2002 to 2016 are selected using valid keywords in the SID, Google scholar, PubMed and Elsevier databases. Results of studies pooled using random effects model in meta-analysis. The heterogeneity of the sample was checked using Q test and I<sup>2</sup> index. Results Total sample size in this study consists of 1335 individuals with peptic ulcer (121 samples per article). The prevalence of peptic ulcers was estimated 34% (95% CI= 0.25 – 0.43). The prevalence of peptic ulcers was 30% and 60% in woman and man respectively. The highest environmental factor (cigarette) has been addressed

in 30% (95% CI= 0.23-0.37) of patients. The prevalence of *Helicobacter pylori* was estimated in 62% (95% CI= 0.49-0.75) of patients. Conclusion The results of this study show that prevalence of peptic ulcers in Iran (34%) is higher than worldwide rate (6% to 15%). There was an increasing trend in the prevalence of peptic ulcer over a decade from 2002 to 2016.<sup>19</sup>

**RR shah 2011** investigated a cross-sectional descriptive study was carried out among individuals attending the OPD of Medicine, Surgery and Gynaecology & Obstetrics from February 1st 2010 to April 30th 2010 in Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh to see the patterns of prescriptions using World Health Organization core prescribing indicators and some additional indices. A total of 300 patients were included in this study. The average number of drugs per encounter was 3.6 and 1.33% drugs were prescribed by generic name. Use of antibiotic (48% of encounters) was frequent, but injection use (1.33% of encounters) was very low. Only 43.16% drugs were prescribed from EDL of Bangladesh. Percentage of encounters with an antiulcerant, a NSAID and a multivitamin & multimineral prescribed were 69%, 68.67% and 39.33% respectively. So the finding from current study shows a trend towards inappropriate prescribing, particularly the over-prescribing of antibiotics and under-prescribing of generic drugs & from essential drug list of Bangladesh.<sup>20</sup>

**Walaa A. Alholaily et al (2002)** reviews aims to discuss the risk factors which lead to the occurrence of PUD during the period from July 2018 to August 2018. The present review was conducted by searching in Medline, Embase, Web of Science, Science Direct, BMJ journal and Google Scholar for, researches, review articles and reports, published over the past years. Books published on peptic ulcers and on the pathogenesis of human disease

were also included., were searched up to August 2018 for published and unpublished studies and without language restrictions, the selected studies were summarized and un reproducible studies were excluded. If several studies had similar findings, we randomly selected one or two to avoid repetitive results. On the basis of findings and results this review found the H. Pylori and the use of NSAIDs are the most common risk factors for developing PUD, and also the genetic, stress and comorbidity increase the risk of PUD occurrence so successful eradication and prevention of the risk factors should be conducted to prevent the presence of PUD and is complication.<sup>21</sup>

**Benjamin Sally *el at(2001)*** explained that Gastroprotectant drugs are used for the prevention and treatment of peptic ulcer disease and might reduce its associated complications, but reliable estimates of the effects of gastroprotectants in different clinical settings are scarce. We aimed to examine the effects of proton-pump inhibitors (PPIs), prostaglandin analogues, and histamine-2 receptor antagonists (H2RAs) in different clinical circumstances by doing meta-analyses of tabular data from all relevant unconfined randomised trials of gastroprotectant drugs. Gastroprotectant drugs are used for the prevention and treatment of peptic ulcer disease and might reduce its associated complications, but reliable estimates of the effects of gastroprotectants in different clinical settings are scarce. We aimed to examine the effects of proton-pump inhibitors (PPIs), prostaglandin analogues, and histamine-2 receptor antagonists (H2RAs) in different clinical circumstances by doing meta-analyses of tabular data from all relevant unconfined randomised trials of gastro protectant drugs.

**Kakarigi L *el at(2003)*** suggested that Acid is the main cause of problem which is termed PEPTIC. An ulcer is an open sore. Stomach, duodenum



and lower esophagus are the main organs involved in peptic ulceration. The cause of ulcers is infection with *Helicobacter pylori* and a group of medicines as NSAID' S. All data were collected from the Albanian Health Insurance Institute (HII) and analyzed includes out patients use for the period 2004 - 2014. The data is about the consumption of drugs used as a number OF DEFINED DAILY DOSE (DDD's) / 10000 inhabitants day, while the consumption of Omeprazole is 0.18 - 0.19 DDD/1000 inhabitants / day in 2004 - 2014. Proton pump inhibitors are rarely used for the treatment of the ulcerous disease.

**Thomas Reuters(2000)** investigated that, Peptic ulcer disease has been considered a major cause of morbidity and mortality for more than century. First line treatment for PUD involves use of acid suppressing drugs and target against the eradication of *Helicobacter pylori* (*H. pylori*) infection. The data was noted down on a pre-designed proforma and analysed. Records of 200 patients were assessed. About 91% of patients were prescribed anti *H. pylori* kit and the most commonly prescribed kit was Esomeprazole H.P kit (59.7%) followed by Pantoprazole H.P kit. Following this, all patients were started using Proton pump inhibitors (PPI) for duration of about  $6.89 \pm 2.25$  weeks. Esomeprazole based HP kit was preferred, since several studies have shown them to be more efficacious. This was followed by a course of PPI to prevent recurrence.

**Francil et at (1999)** investigated that bacterial, host, and environmental factors all have a role in peptic-ulcer disease. There is increase in hospital admissions for ulcer complications associated with non-steroidal anti-inflammatory drugs (NSAIDs).They suggested that prescription of NSAIDs along with potent antiulcer agents and the use of highly selective cyclooxygenase-2 inhibitors reduce gastro duodenal ulceration. The interaction

between H pylori and NSAIDs is one of the most controversial issues in peptic ulcer disease. There is fall in rates of H pylori infection and the proportion of ulcers not related to this organism and NSAIDs has risen, which will affect the management of peptic ulcer.

**Joseph B Kirsher(2000)** investigated that peptic ulcer deals almost exclusively with clinical aspects of the problem and excludes the many important studies of gastric secretion in animals and numerous reports on experimental peptic ulcer. The literature on the medical treatment of peptic ulcer may be characterized as quiescent. Except possibly for the continuing studies on antipeptic agents and carbenoxolone, no completely new therapeutic agents have been described during the past year. Perhaps we can look forward to a new approach in the development of compounds inhibiting gastric. The articles on gastric freezing include clinical evaluations and also anatomical studies of the histological effects of freezing upon the gastric and duodenal mucosa.<sup>26</sup>

**Sudarshan Mukhopadhyay (2006)**, Ulcer is a common gastrointestinal disorder which is seen among many people. It is basically an inflamed break in the skin or the mucus membrane lining the alimentary tract. Ulceration occurs when there is a disturbance of the normal equilibrium caused by either enhanced aggression or diminished mucosal resistance. It may be due to the regular usage of drugs, irregular food habits, stress, and so forth. Peptic ulcers are a broad term that includes ulcers of digestive tract in the stomach or the duodenum. The formation of peptic ulcers depends on the presence of acid and peptic activity in gastric juice plus a breakdown in mucosal defenses. Ulcer is a common gastrointestinal disorder which is seen among many people. It is basically an inflamed break in the skin or the mucus membrane lining the alimentary tract. Ulceration occurs

when there is a disturbance of the normal equilibrium caused by either enhanced aggression or diminished mucosal resistance. It may be due to the regular usage of drugs, irregular food habits, stress, and so forth.<sup>27</sup>

**Xiaoyuhuan et al (2005)** investigated the therapeutic efficacy and safety of Sijunzi Decoction (SJZD) for peptic ulcers (PUs) through the assessment of randomized controlled trials (RCTs). Five English and four Chinese databases were systematically searched to identify eligible RCTs that investigated the effect of SJZD for PUs. SJZD was used either independently or concomitantly with routine anti-ulcer treatments and compared with no intervention, placebo, or conventional therapy. Outcomes evaluated included ulcer healing, symptom improvement, *Helicobacter pylori* (Hp) eradication, ulcer recurrence, and adverse reactions. Five English and four Chinese databases were systematically searched to identify eligible RCTs that investigated the effect of SJZD for PUs. SJZD was used either independently or concomitantly with routine anti-ulcer treatments and compared with no intervention, placebo, or conventional therapy. Outcomes evaluated included ulcer healing, symptom improvement, *Helicobacter pylori* (Hp) eradication, ulcer recurrence, and adverse reactions.<sup>28</sup>

**Richard H Hunt (2004)** said that Over the past few decades, since the introduction of histamine H<sub>2</sub>-receptor antagonists, proton-pump inhibitors, cyclo-oxygenase-2-selective anti-inflammatory drugs (coxibs), and eradication of *Helicobacter pylori* infection, the incidence of peptic ulcer disease and ulcer complications has decreased. For patients at risk of developing an ulcer or ulcer complications, it is important to choose carefully which anti-inflammatory drugs, nonselective NSAIDs or coxibs to use, based on a risk assessment of the patient, especially if the high-risk patient also requires

aspirin. Testing for and eradicating *H. pylori* infection in patients is recommended before starting NSAID therapy, and for those currently taking NSAIDs, when there is a history of ulcers or ulcer complications. Understanding the pathophysiology and best treatment strategies for non-NSAID, non-*H. Pylori*-associated peptic ulcers present a challenge.

**Balaji Ommuruganel *et al* (2001)** stated that Various drugs have been used to treat peptic ulcer disease like proton-pump inhibitors, histamine (H<sub>2</sub>) receptor antagonists, prostaglandin analogues and sucralfate. these drugs are complex, expensive and toxic,so efforts have been constantly made to find a suitable, palliative and curative agent for the treatment of peptic ulcer disease from natural products of plant and animal origin. Recently antioxidants are being used to treat peptic ulcer disease. Antioxidants help in scavenging the free radicals and controlling the oxidative stress responsible for the progression of peptic ulcer [2]. Coenzyme Q10 (CoQ10) and L-glutamine have antioxidant property, and their role as antioxidants has been documented in the literature in treating medical conditions.<sup>30</sup>

## **AIM & OBJECTIVES**

### **3.1 Aim:**

Epidemiological evaluation and drug utilization pattern of drugs used in Peptic ulcer.

### **3.2 Objectives:**

- Age factors
- Types of drug used
- gender
- Time duration
- Drugs prescribed in other diseases
- Types of therapy

## **MATERIALS AND METHODS**

### **4.1 Study design:**

It was a concurrent study.

### **4.2 Study site:**

The study was carried out online randomly.

### **4.3 Sample size of the survey:**

In this study, the total no. Of questionnaire form evaluated were 56.

### **4.4 Inclusion criteria:**

Person from age group above 12 years were included.

All gender people were involved.

### **4.5 Exclusion criteria:**

In this study, children below 12 were excluded.

### **4.6 Duration of study:**

The study was carried out for a period of one week.

### **4.7 Source of data:**

Questionnaire based.

### **4.8 Statically analysis:**

Microsoft word.

WPS office.

Google forms.

## RESULT AND DISCUSSION

### 5.1 Age factor vs percentage response on peptic ulcers :

The online survey of the patient suffering from peptic ulcer was done and different responses of patient were recorded. Various parameters was taken into consideration. From the 63 response recorded via survey based on the questionnaire response, peptic ulcers occur at any age mostly. Minimum percentage response was shown in the age group ranging from 12- 25 years. The Table 1.1 clearly represent the relation between age and percentage response.

S.no.	Age	Response(in percent)
1	12-25 years	11.1%
2	25-40 years	22.2%
3	More than 40 years	23.8%
4	At any age	42.9%

Table no.-5.1.1 (Representing age of patient and Percentage response )

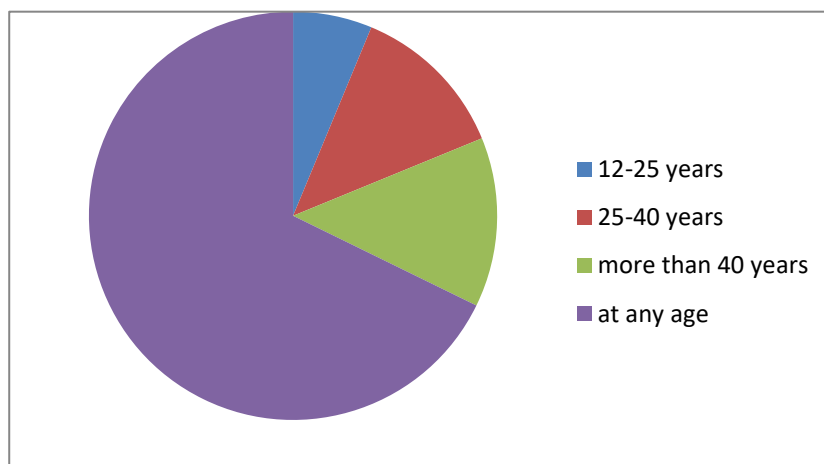


Figure no.-5.1.2(Pie chart depicting age of patient vs. percentage response)

### 5.2 Treatment therapy including allopathic vs Herbal drugs

The other parameter which was taken into consideration was the type of drug used in peptic ulcer patient. The no. of people depending on the allopathic treatment is more as compared to herbal according to the survey. Patient using Allopathic drugs were 66.7% and that of herbal drugs are 46%. Results are expressed below in tabular form and pie chart also.

S.no.	Type of drug	Response (in percent)
1	Herbal	46%
2	Allopathic	66.7%

Table no.-5.2.1(Table depicting type of drug used and percentage response)

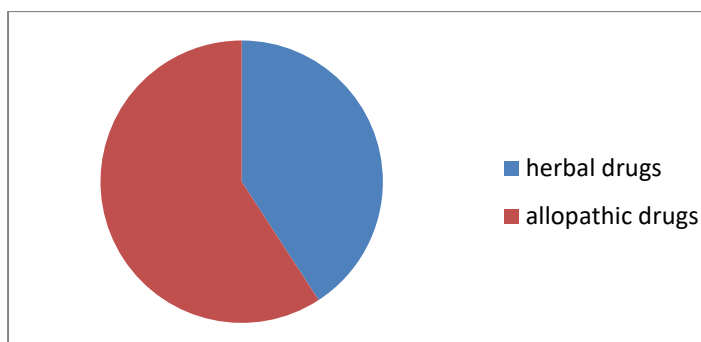


Figure no.-5.2.2 (Pie chart representing type of drug used for peptic ulcer treatment)



### 5.3 Gender based response:

On the basis of online survey it was observed that males are more affected by peptic ulcer disease as compared to female candidates. The percentage of males affected is 69.8% which is far more as compared to females which are 30.2%.

S.no.	Gender	Response (in percent)
1	Male	69.8%
2	Female	30.2%

Table no.-5.3.1 (Table depicting gender and percentage of response)

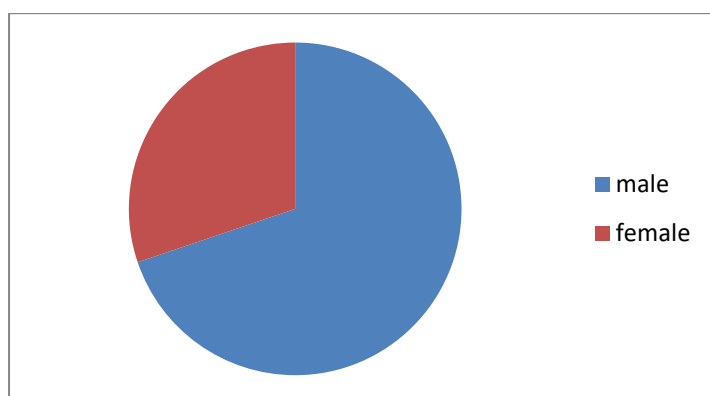


Figure no.-5.3.2 (pie chart representing Gender vs percentage response)

### 5.4 Time duration:

Onset of the peptic ulcer disease depends on the type of treatment

used basically. As per the survey, many people are not informed about the duration and mostly it happens to be 5-7 days. The percentage response is depicted in the table below:

S.no.	Time duration	Response (in percent)
1	Duration not prescribed	22.2%
2	3 days	15.9%
3	5-7 days	25.4%
4	7-10 days	9.5%
5	10-15 days	14.3%
6	30 days	15.9%
7	Don't know	1.6%

Table no.-5.4.1 (Time duration of peptic ulcer disease and percentage response)

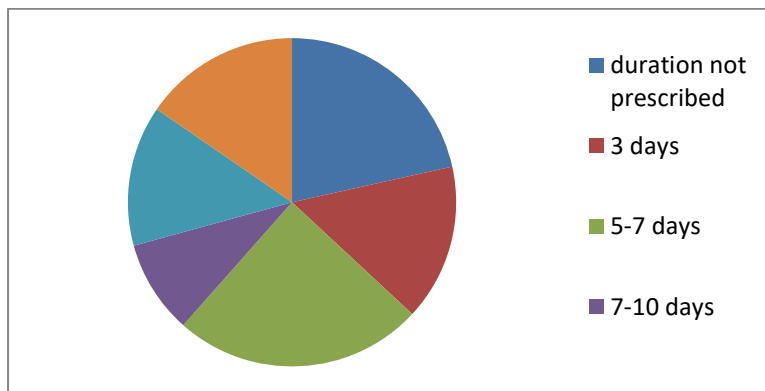


Figure no.-5.4.2 (Duration of peptic ulcer disease)

### 5.5 Peptic ulcer drugs prescribed in other diseases:

According to the survey, following are the diseases in which peptic ulcer drugs are prescribed namely plasmodium vivax infection , malaria, cancer, orthopaedic disease , Dermatological, Gynaecological diseases.

S.no.	Diseases
1	Plasmodium vivax infection
2	Malaria
3	Gynaecological diseases
4	Orthopaedic diseases
5	Dermatological diseases
6	Cancer
7	Infertility
8	Crohns' disease
9	Respiratory diseases

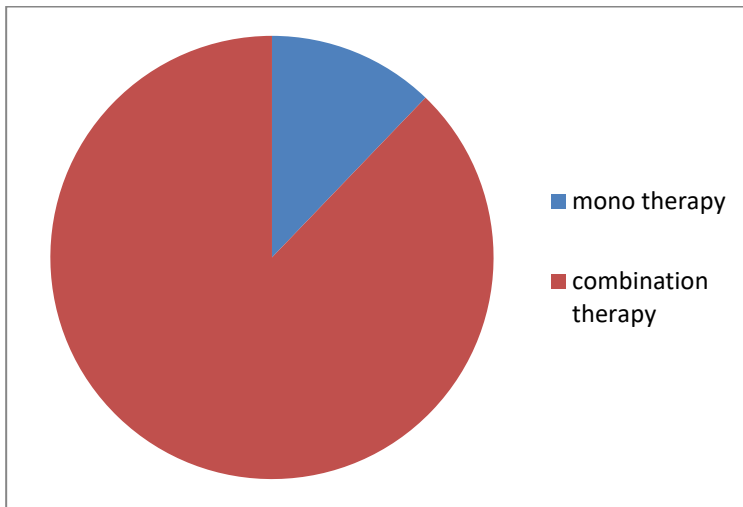
Table no.-5.5.1 (peptic ulcer drugs used in other diseases)

### 5.6 Types of therapy:

Online survey was done to reveal that patient suffering from peptic ulcer disease were mostly on Combination therapy as compared to monotherapy. 55.6% of the patient were on multiple drug therapy while only 44.4% were using multiple drugs for peptic ulcer treatment.

S.no.	Types of therapy	Response
1	Mono therapy	44.4%
2	Combination therapy	55.6%

Table no.-5.6.1 (Depicting type of therapy and percentage of patient using it )



**Figure No-5.6.2 (pie chart representing types of therapy and percentage response )**

## CONCLUSION

The primary object of this project was epidemiological evaluation and drug utilization pattern of drug used peptic ulcer patients by conducting a survey online. From the result as per survey, it was concluded as:

- Peptic ulcers can occur at any age.
- Allopathic drugs are more preferred in the treatment of the peptic ulcer than herbal drugs.
- More male patients are affected as compared to females.
- The actual time duration depends on many factors such as age, type of therapy, nature of medicines, but we can conclude that 25.4% people take 5-7 days to recover from peptic ulcers.
- There are a number of diseases in which the peptic ulcer drugs are given for the treatment like cancer, infertility, respiratory diseases, malaria etc.
- More number of people prefers combination therapy (55%) over mono therapy (44%) for the treatment of peptic ulcer.

# Questionnaire Based on Survey regarding Peptic Ulcer

Peptic ulcer disease refers to painful sores or ulcers in the lining of the stomach or first part of the small intestine, called the duodenum. Peptic ulcer disease (PUD), also known as a peptic ulcer or stomach ulcer, is a break in the lining of the stomach, first part of the small intestine, or occasionally the lower esophagus. The most common symptoms are waking at night with upper abdominal pain or upper abdominal pain that improves with eating. The pain is often described as a burning or dull ache. Other symptoms include belching, vomiting, weight loss, or poor appetite.

This survey is based on your knowledge, Attitude and Practices about Peptic ulcers. We really need your help to fill in this survey, you can withdraw your participation at any time and you are free to leave out questions if you like. Please answer all questions.

\* Required

Informed consent form

I hereby declare that, your personal information will be kept confidential and not used to publicize. This survey study is based on Knowledge, Attitude and Practice (KAP) analysis.

I consent to take part in this survey \*

Yes

No

Name \*

Your answer

Gender \*

Male

Female

Other

Age \*

Your answer

Do you know about peptic ulcers? \*

Yes

No

Little bit

Peptic ulcer is \*

Communicable disease

Non-communicable disease

I don't know

Have you ever suffered with this disease? \*

Yes

No

In which age Peptic ulcers arise commonly? \*

12-25 years

25-40 years

more than 40 years

At any age

Other:

Which form of drug you take to cure peptic ulcers? \*

Tablets

Injection

Powder

Liquids (Gels/solutions/syrups)

Others

Any specific product you use for peptic ulcer? Yes/No If yes then please mention name \*

Your answer

Duration of prescription of drug by the doctor? \*

Duration not prescribed

3 days

5-7 days

7-10 days

10-15 days

30 days

Other:

Route of administration of the particular drug \*

oral

parenteral

Other:

Is any food material causing you peptic ulcers? If yes then Name \*

Your answer

Do you use any home remedy for treating peptic ulcers? \*

Yes

No

Nature of drugs you use for the treatment of peptic ulcer \*

Herbal

Allopathic

How many times the drug taken per day \*

Once a day

Twice a day

Thrice a day



More than 4 times

Which drug you use as an anti-peptic ulcer drugs? \*

Sucralphate ( CARAFATE )

Antacid (GELUSIL )

Pantoprazole (PAN-D)

Omeprazole (OMIND)

Esomeprazole (ESUZ)

Others

Which mode of therapy is prescribed to you ? \*

Mono therapy

Combination therapy

Any indication prescribed by the doctor before and after taking the drug \*

Yes

No

Informed consent form

I hereby declare that, your personal information will be kept confidential and not used to publicize. This survey study is based on Knowledge, Attitude and Practice (KAP) analysis.

I consent to take part in this survey \*

Yes

No

Name \*

Your answer

Gender \*

male

female

Other

Age \*

Your answer

Do you know about peptic ulcers? \*

Yes

No

Little bit

Peptic ulcer is \*

Communicable disease

Non-communicable disease

I don't know

Have you ever suffered with this disease ? \*

Yes

No

In which age Peptic ulcers arise commonly? \*

12-25 years

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At any age

Other:

Which form of drug you take to cure peptic ulcers? \*

Tablets

Injection

Powder

Liquids (Gels/solutions/syrups)

Others

Any specific product you use for peptic ulcer? Yes/No If yes then please mention name \*

Your answer

Duration of prescription of drug by the doctor? \*

Duration not prescribed

3 days

5-7 days

7-10 days

10-15 days

30 days

Other:

Route of administration of the particular drug \*

Oral

parental

Other:

Is any food material causing you peptic ulcers? If yes then Name \*

Your answer

Do you use any home remedy for treating peptic ulcers? \*

Yes

No

Nature of drugs you use for the treatment of peptic ulcer \*

Herbal

Allopathic

How many times the drug taken per day \*

Once a day

Twice a day

Thrice a day

More than 4 times

Which drug you use as an anti-peptic ulcer drugs? \*

Sucralphate (CARAFATE )

Antacid ( GELUSIL )

Pentoprazole (PAN-D)

Omeprazole (OMIND)

Esomeprazole (ESOZ)

Others

Which mode of therapy is prescribed to you? \*

Mono therapy

Combination therapy

Any indication prescribed by the doctor before and after taking the drug \*

Yes

No

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