

An Insight Survey of Anti-ulcer Drugs Prescribing Trends and Market Analysis in Bangladesh

*A dissertation submitted to the Department of Pharmacy, Faculty of Allied Health
Sciences, Daffodil International University
for the partial fulfillment of the requirements for the degree of Master of pharmacy
(M.Pharm).*



Student ID: 183-46-229

Session: Fall 2018

Batch: 7th

**Department of Pharmacy
Faculty of Allied Health Sciences
Daffodil International University**

APPROVAL

This Project, **An Insight Survey of Anti-ulcer Drugs Prescribing trends and Market analysis in Bangladeshi market**, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of Master of Pharmacy and approved as to its style and contents.

BOARD OF EXAMINERS

Professor Dr. Muniruddin Ahmed

Head of the Department

Professor and Head

Department of Pharmacy

Faculty of Allied Health Sciences

Daffodil International University

Internal Examiner-1

Internal Examiner-2

External Examine

DECLARATION

In order to partially fulfill the requirements for the degree of Master of Pharmacy, I hereby certify that this project report was completed by me under the supervision of **Mr. Md A.K. Azad**, Assistant Professor & Coordinator M.pharm, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University. I hereby certify that this Project is entirely original to me. Additionally, I certify that neither this project nor any of its components have been presented anywhere for the award of a master's degree or any other degree.

Supervised By:



Mr. Md. A.K. Azad

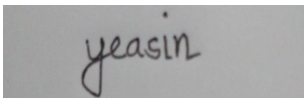
Assistant Professor & Coordinator M.pharm

Department of Pharmacy Assistant

Faculty of Allied Health Sciences

Daffodil International University

Submitted By:



Md. Yeasin Siddique

ID: 183-46-229

Department of Pharmacy

Daffodil International University

ACKNOWLEDGEMENT

All praise is for almighty Allah who has given me ability to complete my M.Pharm project work and the opportunity to study in this subject.

I owe **Mr. Md A.K. Azad**, Assistant Professor & Coordinator M.pharm, Department of Pharmacy, Daffodil International University, my gratitude and admiration for her creative supervision, insightful criticism, active encouragement, polite operating style, and original guidance of daily work. I want to express my gratitude and my sincere appreciation to her for her prolonged cooperation and valuable information. I take this opportunity to offer my thanks to **Professor Dr. Abu Naser Zafor Ullah**, Dean, Department of Pharmacy, Daffodil International University.

I want to convey my special thanks to **Dr. Muniruddin Ahmed**, Professor and Head, Department of Pharmacy, Daffodil International University.

It gives me great pleasure to express my gratitude to all of the esteemed teachers in the pharmacy department at Daffodil International University who have offered their assistance and supportive demeanor whenever I have needed it.

Cordial thanks to my family and friend and to all well-wisher for their wholehearted inspiration and open-ended support throughout the period of the project of the research work.

Md. Yeasin Siddique
Author

Dedication

**I would like to dedicate my work to my first teacher who is my Parents whom I learnt ABC
from-**

Md. Abdul Malak Siddik

Most. Moushumi Yeasmin

ABSTRACT

Gastrointestinal disorder is very common in our country, if we make a survey with prescriptions we can see a huge portion of total prescriptions contain one or several anti-ulcer drugs. However it is not always prescribed for GI disorder but also in the protective purposes.

Data on such an important and so used drug group should be useful in many purposes. From that sense this project was chosen and conducted, by the grace of Allah it was completed without any complications.

The goal of this study is to determine which generic names are preferred by doctors in Dhaka City and Bangladesh while prescribing anti-ulcer medications. The doctors and patients of Dhaka City were personally interviewed for a questionnaire-based field study, and the results were noted and prescriptions were gathered. The questionnaire asked about factors like the age range of patients who received anti-ulcer medicine prescriptions, the cause of the preference, and the preference for pediatric, geriatric, and pregnant patients. Esomeprazole was the preferred drug overall (32.3% of all prescriptions), but for pregnant women, pantoprazole was chosen (40.3%). The poll received a fair response rate. The survey discovered that most doctors do not favor anti-ulcer medications for pediatric patients or geriatric patients in particular. The most important criteria to consider while selecting a particular anti-ulcer medicine were efficacy and safety. Anti-ulcer medications were most frequently recommended to patients between the ages of 30 and 50.

Contents

Chapter One: Introduction

Serial No.	Topic	Page No.
1.1	Introduction to ulcer	1
1.2	Most common types of ulcers	2
1.2.1	Peptic ulcer	2
1.2.2	Gastric ulcer	2
1.2.3	Duodenal ulcer	3
1.3	Less known ulcers	4
1.3.1	Bleeding ulcer	4
1.3.2	Refractory ulcer	5
1.3.3	Stress ulcer	5
1.4	Formation of ulcer	5
1.5	Ulcer symptoms	6
1.6	Ulcer treatment	6
1.6.1	Antacid	6
1.6.2	PPI	7
1.6.3	H ₂ antagonist	8
1.6.4	Bismuth subsalicylate	8

Chapter Two: Anti-ulcer drugs

Serial No.	Topic	Page No.
2.1	Anti-ulcer drugs	9
2.2	Classification of Anti-ulcer drug	9
2.3	Proton pump Inhibitor	9

Chapter Three: Purposes of the study

Serial No.	Topic	Page No.
3	Purposes of the study	10

Chapter Four: Analytical study

Serial No.	Topic	Page No.
4.1	Methodology	11

4.2	Sampling	12
4.3	Study on omeprazole	13
4.4	Study on esomep	13
4.5	Study on pantoprazole	14
4.6	Study on rabeprazole	15
4.7	Study on ranitidine	16
4.8	Study on antacid	18

Chapter Five: Result

Serial No.	Topic	Page No.
5	Result	19

Chapter Six: Conclusion

Serial No.	Topic	Page No.
6	Conclusion	20

LIST OF FIGURES

Serial No.	Topic	Page No.
------------	-------	----------

1.1	Ulcer at stomach	1
1.2	Peptic ulcer	2
1.3	Gastric ulcer	3
1.4	Duodenal ulcer	4
1.5	Esophageal ulcer	4
LIST OF FIGURES		
Serial No.	Topic	Page No.
2	Summarizes agents that are effective in treating peptic ulcer disease	14-15
2.1	Helicobacter pylori in association with gastric mucosa	17
2.2	Secretion of gastric acid	18
2.3	Administration and fate of cimetidine	19
2.4	Drug interactions with cimetidine	20
2.5	Misoprostol reduces serious gastrointestinal (GI) complications in patients with rheumatoid arthritis receiving nonsteroidal anti-inflammatory drugs	23

LIST OF TABLES

Serial No.	Topic	Page No.
4.1	Study on omeprazole	11
4.2	Study on esomeprazole	12
4.3	Study on pantoprazole	13

4.4	Study on rabeprazole	14
4.5	Study on ranitidin	15

Serial No.	Topic	Page No.
	Reference	21-23

Chapter-1

INTRODUCTION

+

1.1 Ulcers

Ulcers are pore that develop in the lining of the upper gastrointestinal tract. They are known as duodenal ulcers if they develop in the first portion of the small intestine and the duodenum rather than in the stomach, where they are known as gastric ulcers. [1]

A true ulcer can be significantly wider than the minimum 0.5cm (centimeters) required by law. People between the ages of 20 and 50 are more likely to develop duodenal ulcers than people over the age of 40 are.

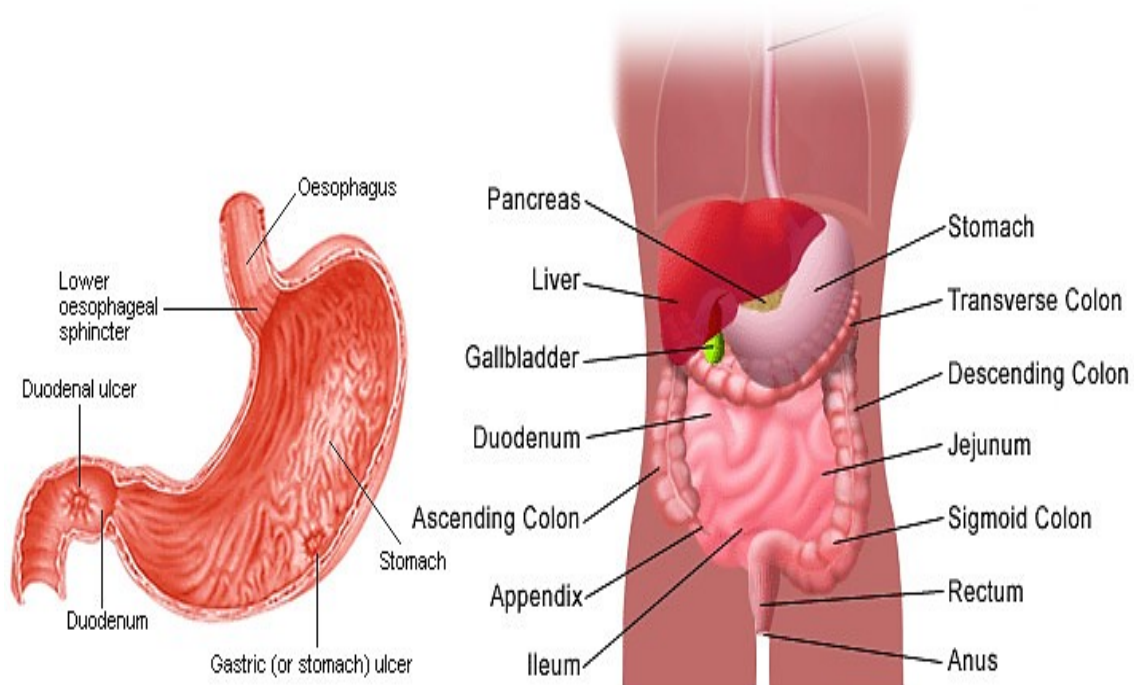


Fig. 1.1: Ulcer at stomach

1.2 Most common types of ulcers

1.2.1 Peptic ulcer

Any ulcer that is exposed in pepsin is referred to as peptic ulcers. Peptic ulcers are found in the lining of our stomach or duodenum and is normally present along with hydrochloric acid in the stomach lining. There are many symptoms of peptic ulcers that are worth checking out. [2]

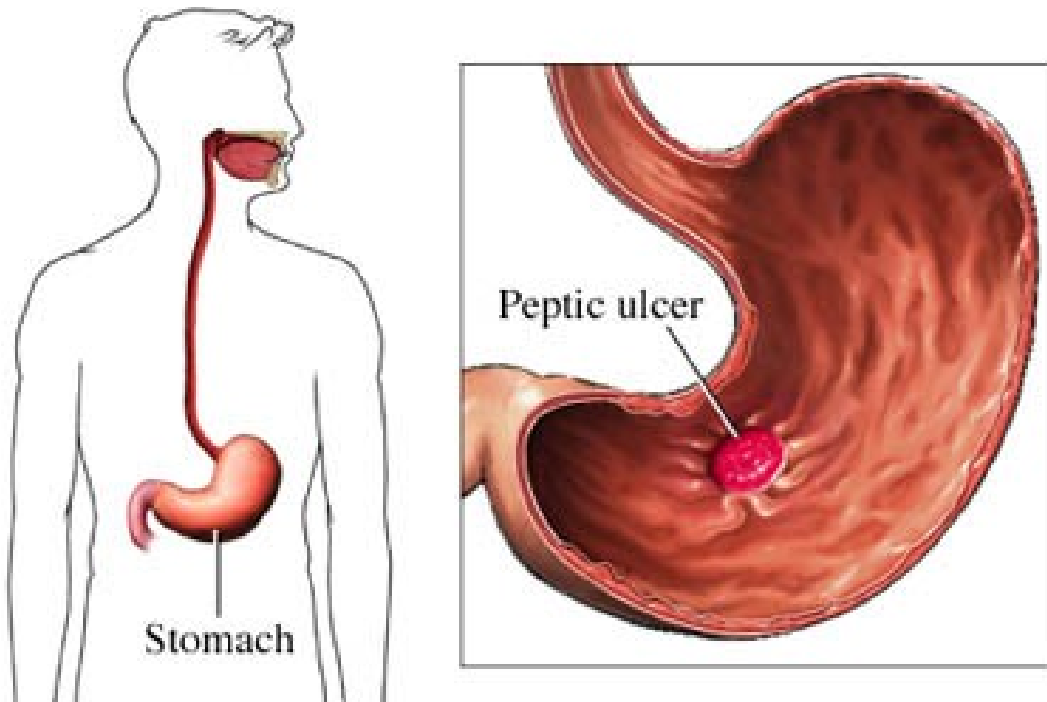


Fig. 1.2: Peptic ulcer

1.2.2 Gastric ulcer

When a peptic ulcer manifests in the stomach, it is referred to as a gastric ulcer, and the symptoms of a gastric ulcer are more unusual than those of a peptic ulcer. [7]

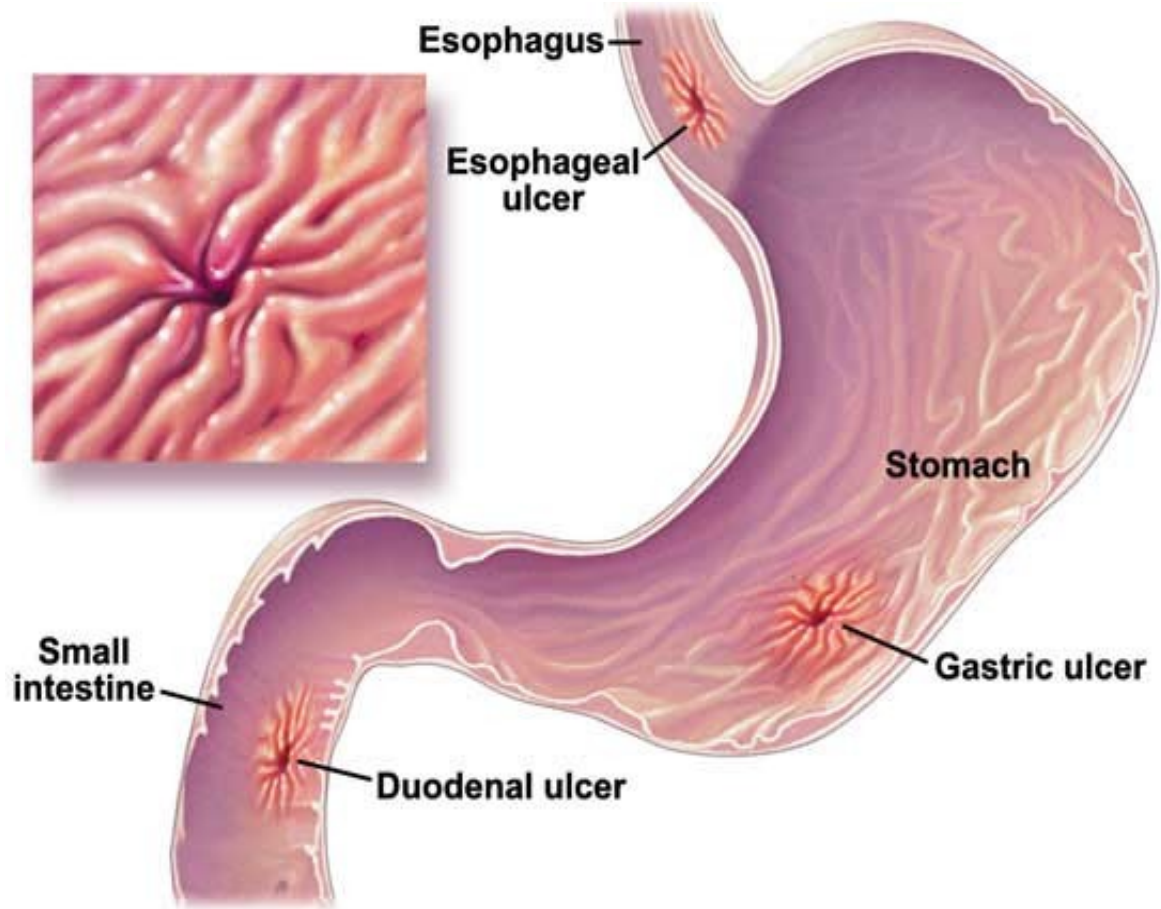


Fig. 1.3: Gastric ulcer

1.2.3 Duodenal ulcer

Duodenal ulcers occur when peptic ulcers occur in the duodenum. These peptic ulcers form in the first section of the small intestine, and surprisingly, some of the symptoms of duodenal ulcers are completely different from those of stomach ulcers. In the Western world, duodenal ulcers are the most typical type of ulcer. [7]

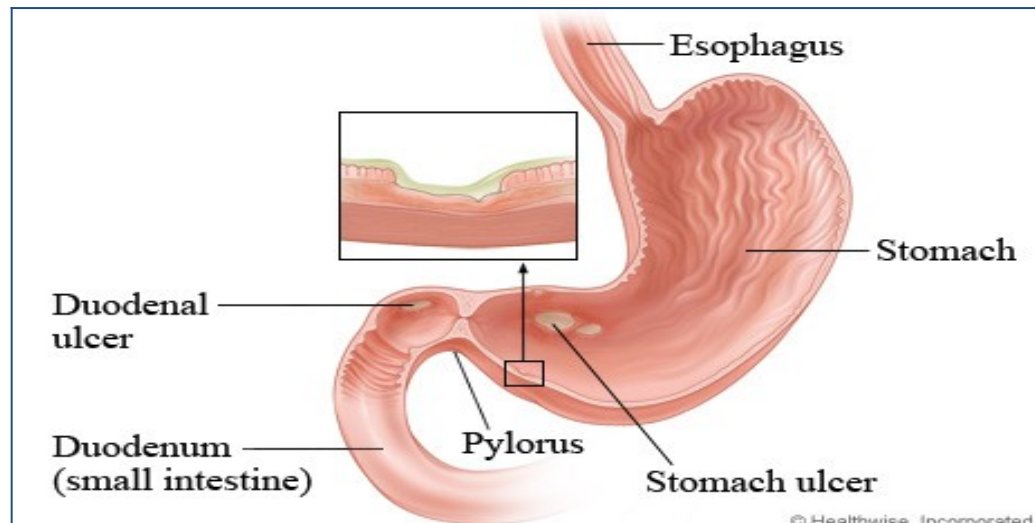


Fig. 1.4: Duodenal ulcer

1.3 Lesser known types of ulcers

1.3.1 Esophageal ulcer

This kind of ulcer develops at the base of your esophagus. A severe case of acid reflux, or GERD as it is more widely known, is frequently linked to esophageal ulcers (short for Gastro Esophageal Reflux Disease). [4]

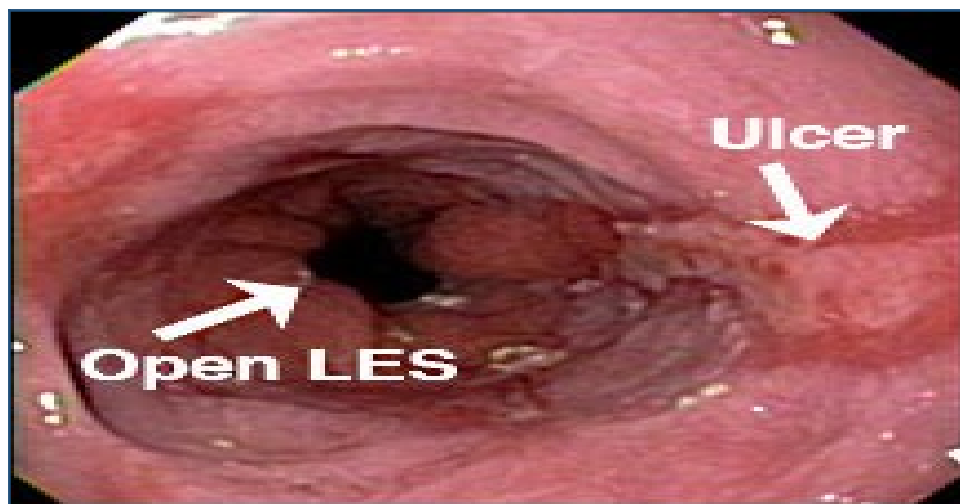


Fig. 1.5: Esophageal ulcer

1.3.2 Bleeding ulcer

A peptic ulcer that is untreated might result in internal bleeding. The term "bleeding ulcer" is now used when this occurs. The most hazardous kind of ulcer is this one. Consequently, if you get symptoms, consult a doctor right once. [21]

1.3.3 Refractory ulcer

Peptic ulcers that have not healed after at least three months or 90 days of treatment are referred to as refractory ulcers. [4]

1.3.4 Stress ulcer

A type of lesions known as stress ulcers can develop in the esophagus, stomach, or duodenum. Only patients who are critically unwell or under a lot of stress typically have it. [4]

1.4 Formation of ulcer

Because of the digestive acids, which are just as deadly as battery acid, our gut is an extremely hostile environment. Typically, a layer of mucus protects the walls of your stomach and duodenum from these acids.

A weakness in your stomach or intestinal lining permits acid to cause an erosion and sore in the lining, which is what causes peptic ulcer disease. The American Gastroenterology Association states that it is the most prevalent type of stomach sickness.

According to Dr. Okolo, "We know that ulcers happen because there has been a breakdown in the balance of factors that harm the digestive system and those that protect it from harm."

The bacteria *Helicobacter pylori* is the root cause of around two out of every three ulcers. Another typical ulcer cause is non-steroidal anti-inflammatory medicines (NSAIDs), which harm the GI tract's protective mucus layer. Examples of NSAIDs are ibuprofen, naproxen, and aspirin. [5]

In the beginning, we might simply have a slight ache in the area of our stomach pit, around midway between our ribs and your navel.

Without treatment, our ulcer may bleed, enlarge, and become quite uncomfortable. It may completely eat through the lining of our stomach or intestine if it is not treated at first, necessitating surgery to fix. In the worst cases, a perforated ulcer can cause serious bleeding and even death.

If we repeatedly have ulcers, they can result in swelling and scarring when they heal, which could one day affect our ability to digest food. We might experience: Appetite loss and inability to consume what we require

Begin vomiting due to a total obstruction by scar tissue Unintentionally lose weight

The good news is that our ulcer will heal before any serious consequences arise if we cooperate with our doctor and take care of it.

1.6 Treatment of ulcer

Acid-neutralizing medicines are frequently used to treat ulcers. Even though stomach acid may not be the primary cause of our ulcers, it can aggravate them and stop them from healing.

1.6.1 Antacids

The burning sensation in our stomach and other immediate ulcer symptoms are treated with over-the-counter calcium carbonate antacids. Tums, Maalox, and Mylanta are the top three brands. The antacid aluminum/magnesium trisilicate is another kind (Gaviscon).

To lessen the acidity, all of these drugs act by gently altering the pH balance in our stomachs. However, if we discover that we must constantly take them in order to feel comfortable, we should consult our doctor for a diagnosis and course of action. [5]

1.6.2 The advent of proton pump inhibitors (PPIs)

According to Patrick I. Okolo, III, MD, MPH, chief of endoscopy at Johns Hopkins Hospital and assistant professor of gastroenterology and hepatology at Johns Hopkins University School of Medicine in Baltimore, "the rate of ulcer surgery has reduced dramatically in the US since the advent of these new PPI drugs." [6]

According to Dr. Okolo, before PPIs, surgery was frequently performed to remove the portion of the stomach that triggered the formation of acid. But because these meds are so powerful, we can forgo surgery and still get the same effects. [6]

PPIs give ulcers a chance to heal by preventing our bodies from producing stomach acid at their typical rate. These medications comprise:

- Omeprazole
- Lansoprazole
- Rabeprazole
- Pantoprazole
- Esomeprazole

These medications need a prescription, with the exception of omeprazole, which is sold without a prescription. Though we might only require them for the two to three months it takes for an ulcer to heal, according to Okolo, "all of the experience suggests that we can take these meds for a very long time."

PPIs are just one of the many medications our doctor might recommend, but each one necessitates adherence to the following two rules: Be patient and take all prescriptions as directed by our doctor. Your ulcer may take up to three months to completely heal.

H2 receptor antagonists, which are frequently used in conjunction with antibiotics to treat a *Helicobacter pylori* infection, the primary cause of peptic ulcers, decrease acid production and may be used for up to six weeks to aid in ulcer healing. [21]

1.6.3 H₂ receptor antagonists

These drugs include:

- Cimetidine
- Ranitidine
- Famotidine
- Nizatidine

1.6.4 Bismuth Subsalicylate

Pepto-Bismol is just one example of a medication that contains bismuth subsalicylate. As they coat the ulcer and shield it from irritation, our doctor might advise using them while our ulcer heals. Our tongue and stools often become black after taking this medication, which is a regrettable side effect. [9]

1.6.5 Prevention of ulcer

Our doctor may advise ongoing medication therapy to stop the development of new ulcers depending on our particular health state. Proton pump inhibitors or H₂ receptor antagonists were shown to help prevent the formation of ulcers from the aspirin, according to a study of 68 healthy volunteers who took low dosages of aspirin to avoid heart disease.

Peptic ulcers are most commonly caused by aspirin and other NSAIDs, who are the second most common cause. For this reason, it's crucial to stay away from NSAIDs whenever possible while allowing an ulcer to heal. Other medications in this class include naproxen and ibuprofen (Motrin, Midol) (Naprosyn, Anaprox, and Aleve).

Make sure our doctor is aware of the medications we are currently taking as well as the best way for us to take the ones he or she has prescribed to treat our ulcer. [3]

Chapter-2

ANTI-ULCER DRUGS

2.1 Anti-ulcer drugs

Anti-ulcer agents are drugs that are used in the treatment of peptic and gastric ulcers. these agents or drugs are divided or classified on the basis of their mechanism of action.

Classification of anti-ulcer drug:

1. Proton pump Inhibitor
2. H₂-antihistamines
3. Anticholinergics
4. Antacids
5. Prostaglandin analogues
6. Anti-helicobacter

2.2 Proton Pump Inhibitor

The way proton pump inhibitors (PPIs) operate is by lowering the quantity of stomach acid that the glands in the lining of your stomach produce.

Example: a) Omeprazole

- b) Esomeprazole
- c) Rabeprazole
- d) Pantoprazole
- e) Dexlansoprazole Etc.

Chapter-3

PURPOSE OF STUDY

The importance of a good market analysis in our area cannot be over emphasized. A good market analysis will have an economy overview, which is very helpful in understanding where current market is and where it is going.

My analysis focuses on anti-ulcer drugs that are marketed in Bangladesh, which can tell me if a specific drug of new pharmaceutical industry is growing or not. This can be important in identifying pharmaceutical industries which have marketed most anti-ulcer drugs in Bangladesh. It is also helpful in establishing parallels in which one industry may suffer.

The study evaluated:

- The prevalence of ulcer among different age group in Bangladesh.
- Identification of various age group who are “at risk” for facing ulcer.
- Identification of various therapeutic classes of medications which are used to treat ulcer.
- For assessing variable types of anti-ulcer drugs marketed in Bangladesh.
- Identify the guidelines for the prevention, detection and management of ulcer.
- Identify clinical guidelines for ulcer management.
- Use of medications to treat ulcer.
- Age-specific and age-standardized rates.
- Find out the most popular anti-ulcer drugs that are prescribed by doctor in Bangladesh.

Chapter-4

ANALYTICAL STUDY

4.1 Methodology

To analyze the market of anti-ulcer drugs, 106 no. of prescriptions were collected on random basis each of which contains at least one anti-ulcer drug.

Firstly, drugs were categorized by their Generic name.

Secondly, in a generic category number of brands of different companies were counted.

Thirdly, percentages were found by calculating found number of brands among all of that category. That is the market share of that company in percentage for that drug.

4.2 Sampling

Prescriptions were collected from different patients prescribed by different doctors.

Among all different classes six types of anti-ulcer drugs were found in the prescriptions. Those are:

1. Omeprazole
2. Esomeprazole
3. Pantoprazole
4. Rabeprazole
5. Ranitidine
6. Antacid

For each of these entire classes market share for each company were found in percentage after counting the number of different brands in the prescriptions.

4.3 Study on omeprazole

Brand name	Company	Amount	Market share
Seclo	Square	9	30%
Losectil	Eskayef	6	20%
Omenix	Incepta	6	20%
Omeprazole	Aristo	3	10%
Ometid	Opsonin	3	10%
Prevas	General	3	10%

Table 4.1: Study on omeprazole

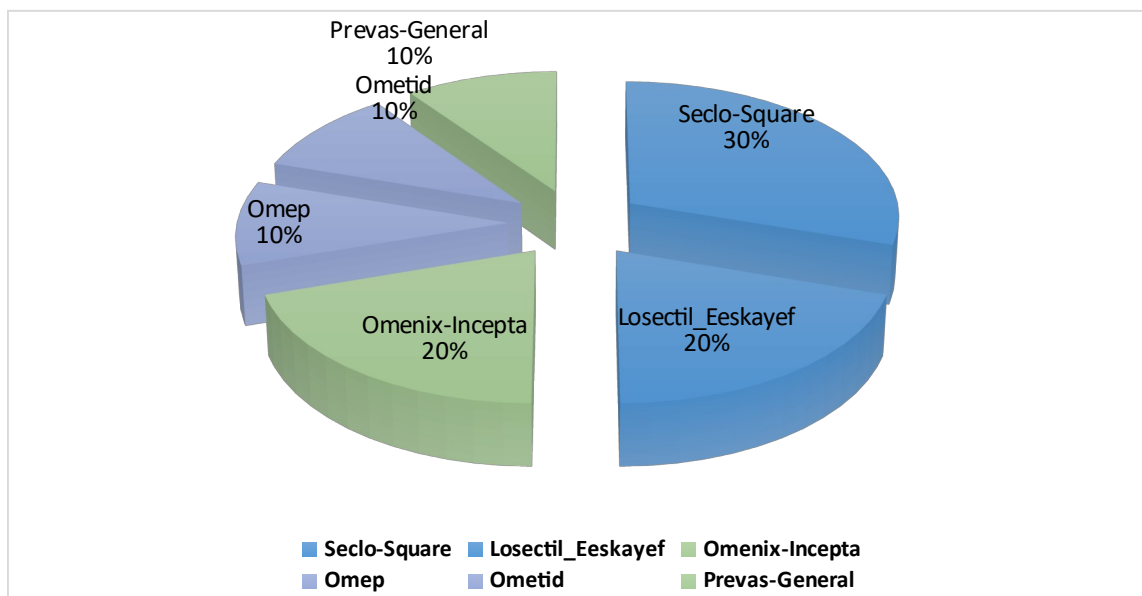


Fig. 4.1: Market share of omeprazole of different brands.

Study shows, Totally 30 patients were given Omeprazole, among which Seclo, a brand of Square Pharmaceuticals Ltd. Occupied the major market share, 30%. Among 30 patients 9

were prescribed Seclor. However, Losecil and Omenix brands of Eskayef and Incepta Pharmaceutical Ltd respectively, each of them were prescribed to 6 patients, however both of them constituted 20% of market share. At the same time Omep, Ometid and Prevas brands of Aristo pharma, Opsonin and General Pharmaceuticals respectively, each of them were prescribed to 3 patients and occupied 10% of total market.

4.4 Study on esomeprazole

Brand	Company	Amount	Market share
Maxpro	Renata	8	36.4%
Nexum	Square	8	36.6%
Esonix	Incepta	4	18.2%
Sompraz	Sun	1	9.1%

Table 4.2: Study on esomeprazole

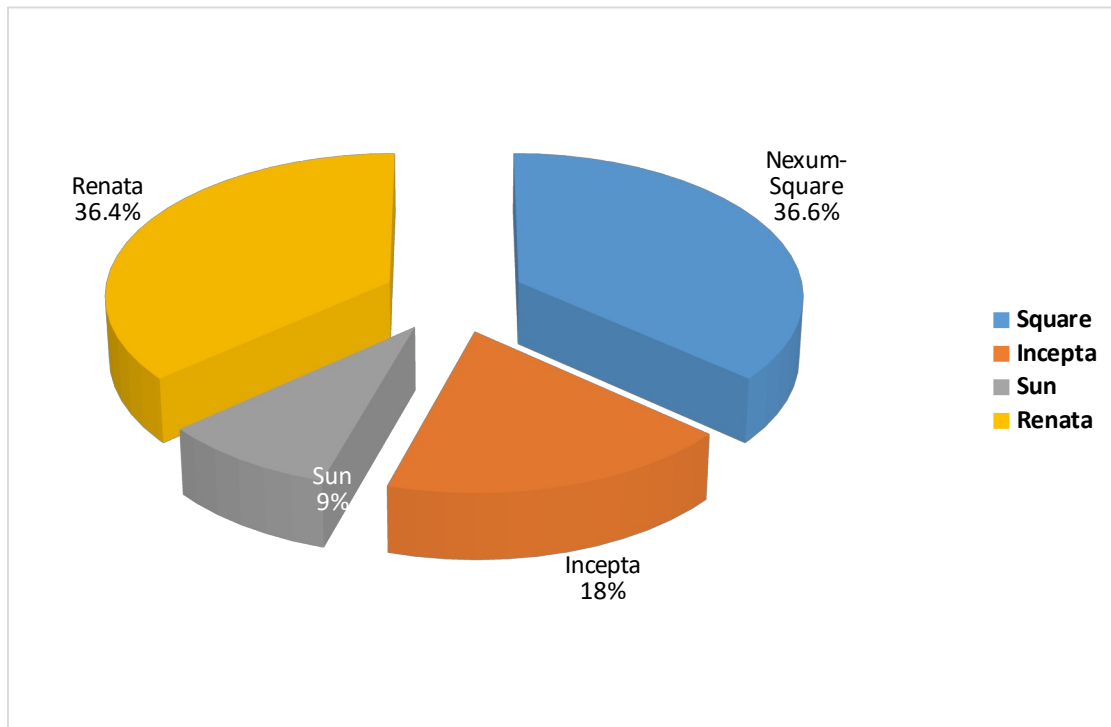


Fig. 4.2: Esomeprazole market share of different brands

This is the second most prescribed category among anti-ulcer drugs. Maxpro and Nexum brands of Renata and Square, each of them Occupied 36.4% of total market and were prescribed to 8 patients. On the other hand Incepta's brand Esonix occupied half of the top two that is 18.2%. At the same time Sompraz, brand of Sun Pharmaceutical was prescribed to 1 patient which is 4.5% of total market.

4.5 Study on pantoprazole

Brand	Company	Amount	Market share
Pantid	Opsonin	3	30%
Pantonix	Incepta	7	70%

Table 4.3: Study on pantoprazole

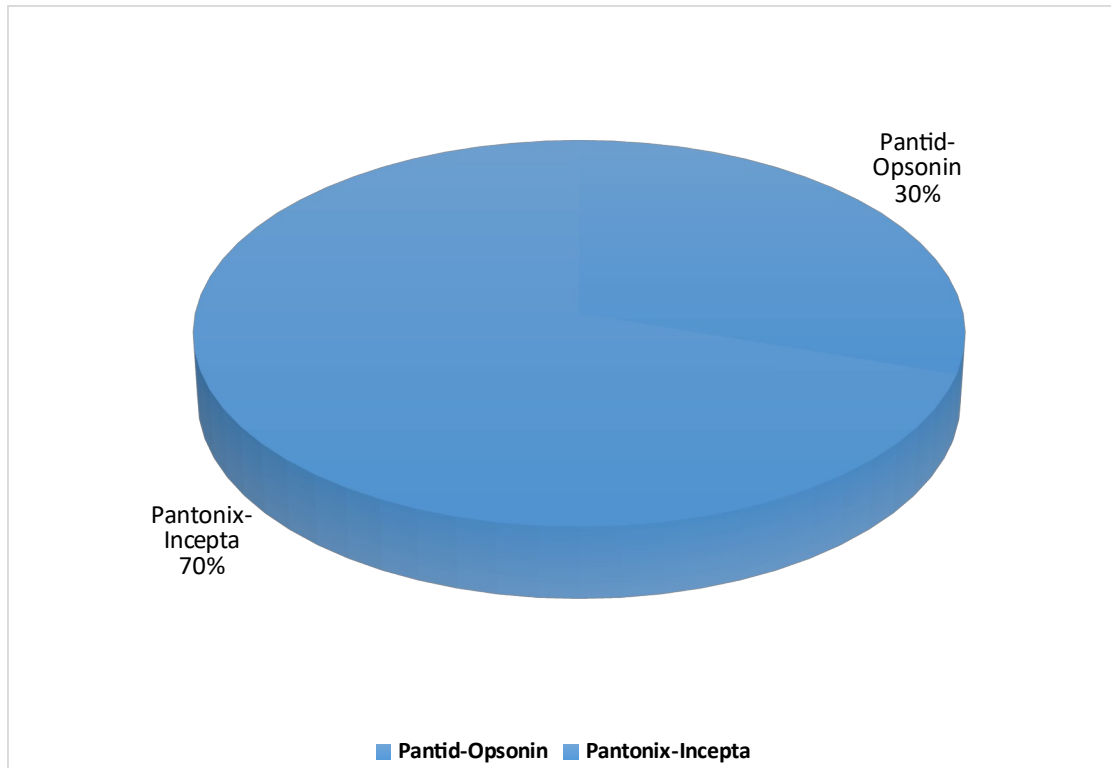


Fig. 4.3: Pantoprazole market share of different brands

Pantoprazole is said to be woman friendly drug. Two pantoprazole brands were found in the prescriptions, which were totally prescribed for 10 times. One is, Pantonix, a brand of Incepta Pharmaceuticals. Prescribers preferred Pantonix for 7 times that gave Incepta 70% share of the market. The second one is, Pantid by Opsonin. Pantid was prescribed 3 times and got 30% of market share.

4.6 Study on rabeprazole

Brand	Company	Amount	Market share
Finix	Opsonin	4	40%
Ranidin	Acme	6	60%

Table 4.4: Study on rabeprazole

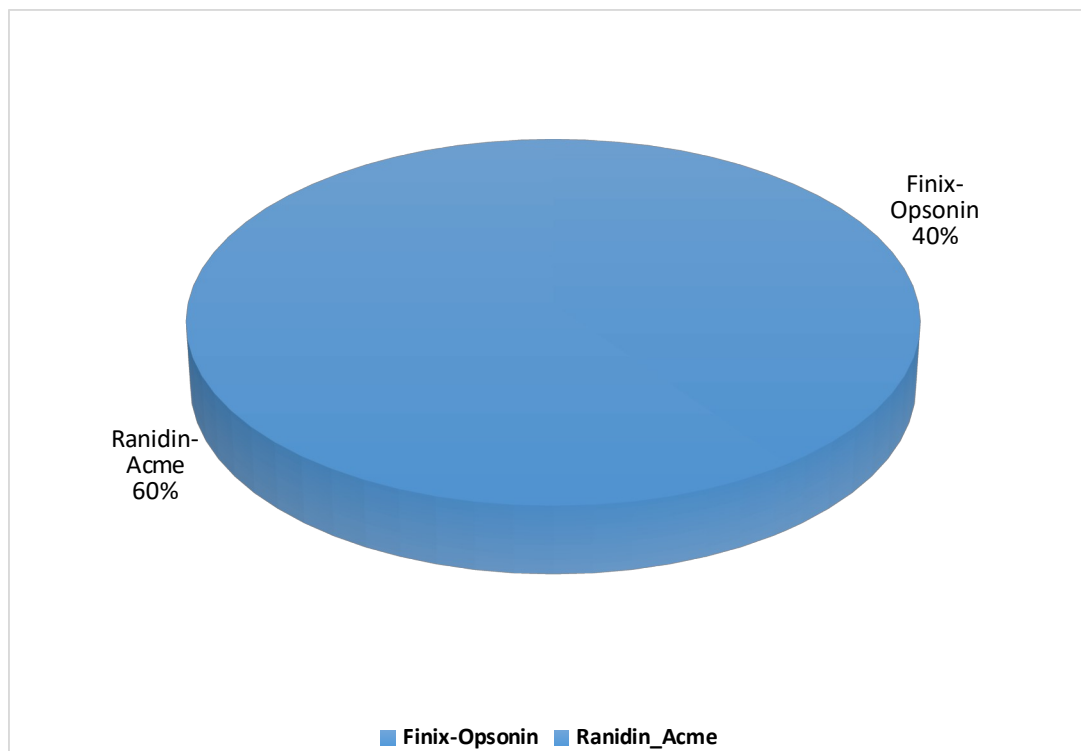


Fig. 4.4: Rabeprazole market share of different brands.

Totally 10 patients were treated with Rabeprazole. Two brands were chosen-Ranicel and Ranidin which are respectively from ACI and Acme. Ranicel got 40% of total market share whereas Ranidin got 60%. They respectively were prescribed to 4 and 6 patients.

4.7 Study on ranitidine

Brand	Company	Amount	Market share
Neotac	Square	8	55%
Ranitid	Opsonin	7	45%

Table 4.5: Study on ranitidine

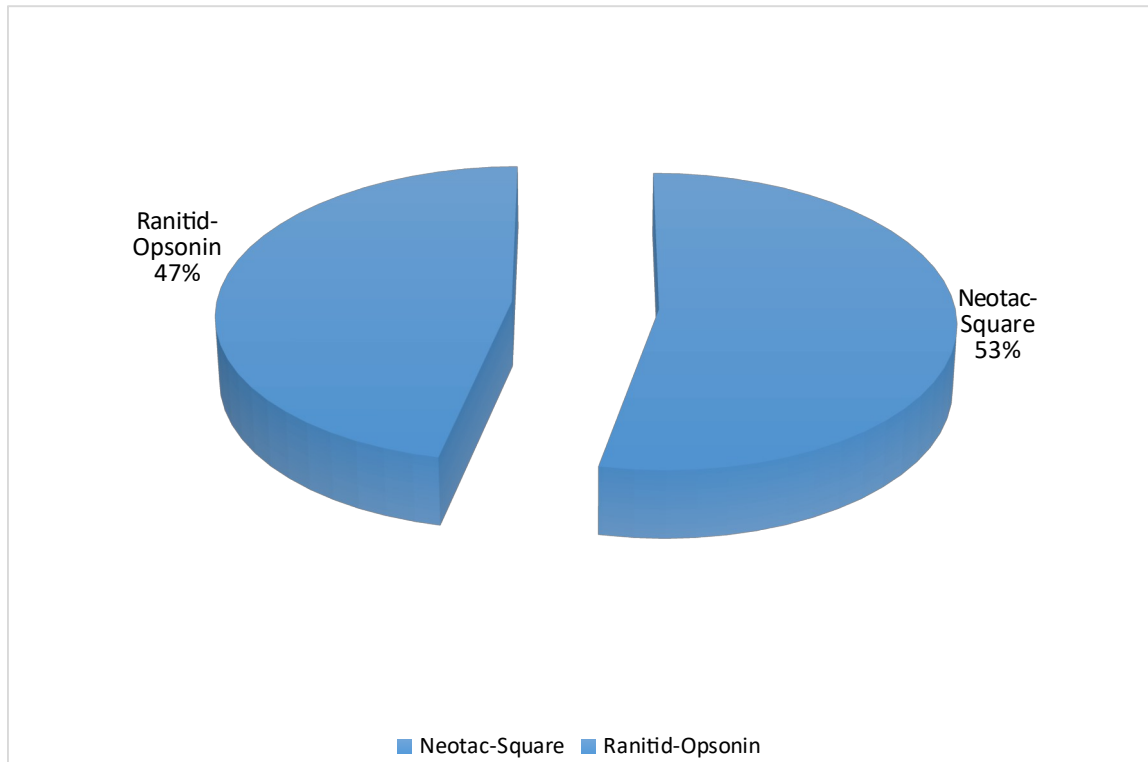


Diagram 4.5: Ranitidine market share of different brands.

Ranitidine was prescribed to 15 patients totally, 8 of which were prescribed Neotac of Square and left 7 were prescribed Ranitid of Opsonin. Between them Neotac occupied 55% and Ranutud occupied 45% of total market.

4.8 Study on Antacid

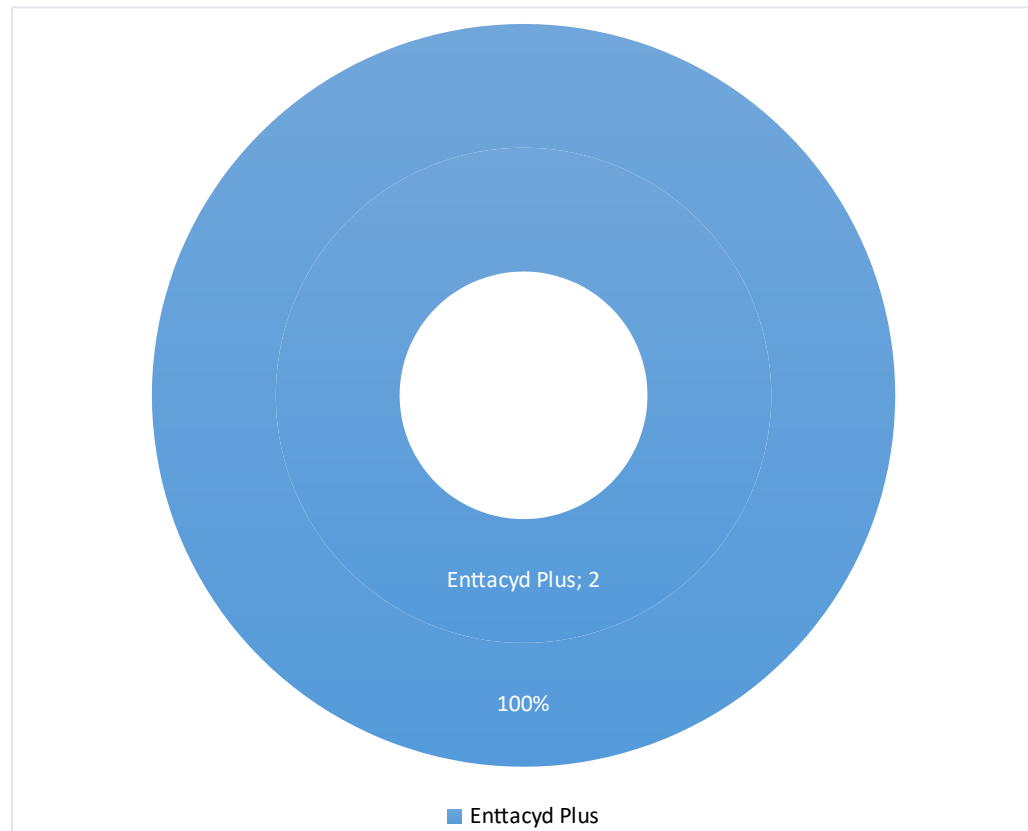


Diagram 4.6: Market share of antacids.

Only 2 patients were prescribed Antacid. Both of them were prescribed Enttacyd Plus, a brand of Square Pharmaceuticals Ltd. According to the research the brand constitute 90% of the total antacid market.

Chapter-5

RESULT & DISCUSSION

Result & discussion

1. Square Pharmaceuticals Ltd is the best seller of Omeprazole.
2. Renata Pharmaceuticals and Drug International are the best seller of Esomeprazole.
3. Incepta Pharmaceuticals Ltd is the best seller of Pantoprazole.
4. Opsonin sales Rabeprazole the most.
5. Square Pharmaceuticals and Opsonin Pharmaceuticals Ltd got 50-50 market share of Ranitidine.
6. Square sells Antacid the highest.

The outcomes provide the critical qualities that physicians and pharmacists seek. When prescribing anti-ulcer medications to patients, product characteristics and price have emerged as key factors. Pharmaceutical businesses work very hard to provide high-quality medications. During the drug development process, they still need to make more advancements. As a result, they can develop treatments that are safer, more effective, and have fewer adverse effects. As a result of end-users considering pricing when prescribing medications to patients, pharmaceutical companies must develop new pricing strategies in order to remain competitive.

Chapter-6

CONCLUSION

Conclusion

I would like to say, this project was prepared in the purpose of completion of my Masters course. Moreover after completion it appeared to be useful in the sector of pharmaceutical marketing this is because of getting a clear concept of market of anti-ulcer drugs from my project.

This project will also helpful for obtaining rational treatment of patient who are taking anti-ulcer drugs.

From this project Drug authority (DGDA) will be helpful in taking action whether patients are prescribed right drugs or not.

In the end it will be very helpful as a public awareness in case of taking anti-ulcer drugs.

References

- [1] C Broom - Early Phase Drug Evaluation in Man, 1990 – Springer
- [2] Behrman SW. Management of complicated peptic ulcer disease. Arch Surg 2005;140:201-8
- [3] Bhattacharya SK, Ghosal S. Concerning the anti-ulcerogenic action of sitoindosides IV. Phytother Res 1987;1:95-7.
- [4] Regina Lamberts. Gastroenterology. Volume 104, Issue 5, May 1993, Pages 1356–1370
- [5] Ali Riza Soylu. Bulent Sivri. Salih Emri. Ahmet Ugur Demir. Gastroenterology. Volume 120, Issue 5, Supplement 1, April 2001, Page A403
- [6] Ziegler AB. The role of proton pump inhibitors in acute stress ulcer prophylaxis in mechanically ventilated patients. Dimens Crit Care Nurs 2005;24:109-14.
- [7] Hopkins RJ, Girardi LS, Turney EA. Relationship between Helicobacter pylori eradication and reduced duodenal and gastric ulcer recurrence: a review. Gastroenterology 1996;110:1244-52.
- [8] Kurata JH, Nogawa AN. Meta-analysis of risk factors for peptic ulcer. Nonsteroidal anti-inflammatory drugs, Helicobacter pylori, and smoking. J Clin Gastroenterol 1997;24:2-17.
- [9] Anti-ulcer drugs promote IgE formation toward dietary antigens in adult patients. The FASEB Journal express article 10.1096/fj.04-3170fje. Published online January 25, 2005.
- [10] Goel RK, Bhattacharya SK. Gastroduodenal mucosal defense and mucosal protective agents. Indian J Exp Biol 1991;29:701-14.
- [11] Tewari PV, Kumar N, Sharma RD, Kumar A. Treatment of Amlapitta (Khila-Sthana). In: Kasyapa Samhita, Tewari P V, editors. Varanasi: Chaukhambha Visva Bharati; 1996. p. 630-5.
- [12] Sanyal AK, Das PK, Sinha S, Sinha YK. Banana and gastric secretion. J Pharm Pharmacol 1961;13:318-9.

- [13] Sanyal AK, Gupta KK, Chawdhury NK. Studies of peptic ulceration Part I: Role of banana in phenylbutazone induced ulcers. *Arch Int Pharmacodyn* 1964;149:393-400.
- [14] Sanyal AK, Gupta KK, Chowdhury NK. Banana and gastric secretion. *J Pharm Pharmacol* 1963;15:283-4.
- [15] Mukhopadhyay K, Bhattacharya D, Chakrabarti A, Goel R K, Sanyal A K. Effect of banana powder (*Musa sapientum* var. *paradisiaca*) on gastric mucosal shedding. *J Ethnopharmacol* 1987;21:11-9.
- [16] Goel RK, Tavares IA, Benntt A. Stimulation of gastric and colonic mucosal eicosanoid synthesis of plantain banana. *J Pharm Pharmacol* 1989;41:747-50.
- [17] Ghosal S, Saini KS. Sitoindosides I and II, two new antiulcerogenic sterylacyl glucosides from *Musa paradisiaca*. *J Chem Research* 1984;110:965-75.
- [18] Ghosal S. Steryl glycosides and acylsteryl glycosides from *Musa paradisiaca*. *Phyto Chem* 1985;24:1807-10.
- [19] Bhattacharya SK, Ghosal S. Concerning the antiulcerogenic action of sitoindosides IV. *Phytother Res* 1987; 1:95-7.
- [20] Chattopadhyay S, Chaudhuri S, Ghosal S. Activation of peritoneal macrophages by sitoindoside-IV, an antiulcerogenic acylsteryl glycoside from *Musa Paradisiaca*. *Planta Medica* 1987;53:16-8.
- [21] Jensen HE, Amdrup E, Christiansen P, et al. Bleeding gastric ulcer. Surgical and non-surgical treatment of 225 patients. *Scand J Gastroenterol* 1972; 7:535-540.
- [22] Negre J. Perforated ulcer in elderly people. *Lancet* 1985; 2:1118-1119.

23. Chitta Venkateswara Rao, K. Venkataramaba. A Pharmacological review on natural ulcer agents. Journal of global trends in para-medical sciences.2013;4(3):1118-1131.
24. Rakesh Pahwa et al. Clinical Manifestations, Causes and Management Strategies of Peptic Ulcer Disease. International journal of pharmaceutical sciences research. 2010; 2(2):99-106.
25. Effectiveness of Lifecycle education in peptic -ulcer patient. World journal of para medical research. 2014; 3(2): 2880-2887.
26. Sharma SK et.al. Hospital based analytical study of peptic ulcer disease in patients with dyspeptic symptoms. Katmandu University medical journal.2009; 2(26): 135-138.
27. http://www.emedicinehealth.com/peptic_ulcers/page2_em.htm#what_causes_peptic_ulcers
28. Anant Patil, Viraj Rajadhyaksha .Evolving role of pharmaceutical physicians in the industry Indian perspective .Perspectives in clinical research.2012; 3(1):35-39.
29. Vishnu Prakash Mishra, Rohit Kumar Vishwakarma. Changing Landscape in Marketing Strategies of Indian Pharmaceutical Industry.2014; SSIJMAR: 2(6), 1-10.
30. A. Alkhateed. Characteristics of Physicians Targeted by the Pharmaceutical Industry to Participate in E-detailing. Health marketing quarterly.2014; 26: 98-116.