



Beneficial Remedies of Ayurvedic Medicines Against Allopathic Drugs In Peptic Ulcer

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Article History	Abstract
Received: 12 June 2023 Revised: 02 Sept 2023 Accepted: 14 Oct 2023	<i>Ayurveda has long been regarded as the most dependable and secure medical system. The effectiveness of Ayurvedic Remedies becomes evident after a certain period of time. These remedies operate by enhancing the immune response or eliciting antagonistic reactions. Ayurvedic treatments utilize substances derived from plants, marine sources, and minerals. These remedies tend to have minimal to no observed side effects due to their natural origin. Here, we compared the Allopathic therapies with Ayurvedic remedies for Peptic Ulcer disease.</i>
CC License CC-BY-NC-SA 4.0	Keywords: Peptic Ulcer, Gastrointestinal, Remedies, Allopathic, Ayurvedic

INTRODUCTION

Peptic ulcer has been known the disease that affects the hosts GIT by making more acidic environment in which the walls of the GIT tract get affected. As an impacted result of it leads to host suffering with remarkable pain and sometime the immediate hospitalization also requires. The current therapies of peptic ulcer involve the allopathic drugs regimens and also the diet change [1]. The allopathic drugs take less time to aid the disease but leads to more serious side effects. The drugs of choice in Peptic ulcer disease are Antibacterial, Antihistamines, Protective film maker drugs and the Protein pump inhibitors. These all drugs are able to produce the therapeutic effect and decreases the biomarkers related to severe damage [2]. However, the side effects of these drugs cannot be altered. On the other hand there is traditional system of medicine known as Ayurveda. The Ayurvedic therapy has been known from the ancient time due to beneficial effects produced by these therapies [3]. It is known that these therapies works in two ways one is by working against the disease and second is already improving the health benefits in human body that it can automatically cure the disease. On the basis of it the therapies are known as preventive effect with pre therapies and therapeutic effect post disease invasion [4].

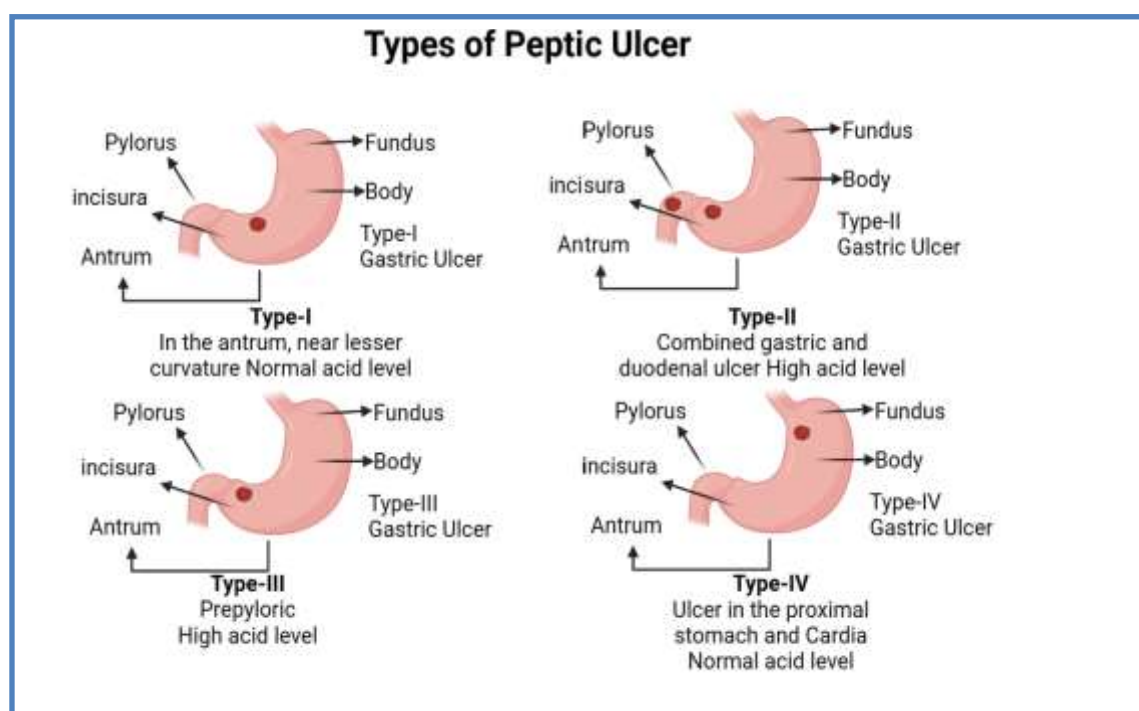
Traditional System of Medicine

Ayurveda, Unani, Siddha, and homeopathy all adhere to ancient systems of medicine, representing forms of healthcare with historical origins. Among these conventional medical approaches, Ayurveda stands out as the most effective treatment method, boasting minimal to no harmful side effects [5]. The term "Ayurveda" originates from the Sanskrit words "Ayus" (Life) and "Veda" (Knowledge). Crafting Ayurvedic remedies involves utilizing a combination of herbs, minerals, and animal-derived ingredients such as milk and bones. This practice also includes trace amounts of potentially toxic substances like lead, arsenic, and mercury [6].

One notable drawback of Ayurvedic treatment is the uncertainty surrounding the duration required for healing. Additionally, a drawback of Ayurvedic medications is their tendency to possess relatively lower potency or effectiveness, often necessitating higher dosages to achieve desired therapeutic outcomes.

To address the limitations of traditional medicine, modern allopathic medicine emerged, offering immediate relief, particularly in emergency situations. However, it is important to note that allopathic medications often come with more severe adverse effects than Ayurvedic counterparts [7]. The term "allopathy" stems from the Greek words "allos" and "pathos," translating to "other than the sickness." While allopathic treatment provides swift relief from ailments, its effects might not be as enduring and can lead to additional negative consequences. In contrast, Ayurvedic medicine tends to exhibit fewer adverse effects and is considered suitable for long-term usage [8].

Ulcers, a gastrointestinal tract disorder, manifest as sores on the mucous membrane and lining of the GI tract. The categorization of ulcers depends on their type or the specific area of damage they inflict [9]. Among ulcers, peptic ulcers are the most prevalent and perilous. They arise due to factors like *Helicobacter pylori* infection, excessive consumption of non-steroidal anti-inflammatory drugs, and overproduction of stomach acid [10].



BACKGROUND

In 1670, Princess Henrietta of England documented the initial account of a peptic ulcer. Later, in 1982, the *Helicobacter pylori* was unveiled as the primary cause of ulcers, thanks to the efforts of Robin Warren and Barry J. Marshall. Their pivotal role in identifying the bacteria "*Helicobacter pylori*" earned the Karolinska Institute in Stockholm the Nobel Prize in 2005 [10,11]. Marshall's inquisitiveness about the impact of *H. pylori* within the human body led him to conduct a self-experiment, which allowed him to demonstrate its effects. The link between *H. pylori* and ulcers is endorsed by the Center for Disease Control and Prevention. In 2005, Marshall and Warren were both honored with the Nobel Prize for their discovery of *H. pylori*. Subsequent to this breakthrough, Warren and Marshall advanced their research. Recognizing that the virus could be readily detected using a patient's blood sample, they pursued further investigations. This paved the way for the implementation of affordable testing techniques that hold great significance in epidemiological studies [12].

It is estimated that approximately two-thirds of the global population carries an *H. pylori* infection. Furthermore, studies have revealed a higher prevalence of *H. pylori* infection among children under the age of 10 residing in developing nations. Interestingly, the presence of an *H. pylori* infection does not necessarily equate to the presence of a peptic ulcer. This realization prompted scientists to delve further, uncovering a correlation between *H. pylori* and stomach cancer [13].

EPIDEMIOLOGY

Globally, approximately 40–60% of individuals experience the burden of ulcers, constituting a widespread ailment that can transmit from person to person through exposure to the vomit of an infected individual. According to various surveys orchestrated by the World Health Organization (WHO), it has been determined that 70% of ulcers can find relief through natural remedies. The trade involving herbal raw materials is projected to reach a substantial USD 6 trillion by the year 2060. In western nations, a higher incidence of peptic ulcers tends to occur, possibly due to their distinctive lifestyles and dietary patterns [14].

The underlying cause of peptic ulcers primarily stems from an imbalance between aggressive and defensive components. The stomach, composed of mucosa, submucosa, and serosa layers, is shielded by a layer of mucous, acting as a defense against hydrochloric acid. The initiation of a stomach ulcer begins with harm to the outer layer, subsequently progressing to the penetration or formation of lesions on the stomach's lining. Notably, herbal compositions present a highly efficacious means of treating ulcers both prior to and during their development [15].

The epidemiology of peptic ulcer disease hinges on a variety of factors that collectively impact global public health. These factors encompass hereditary influences, dietary choices, smoking habits, the consumption of nonsteroidal anti-inflammatory drugs (NSAIDs), and the presence of *Helicobacter pylori* infection [16].

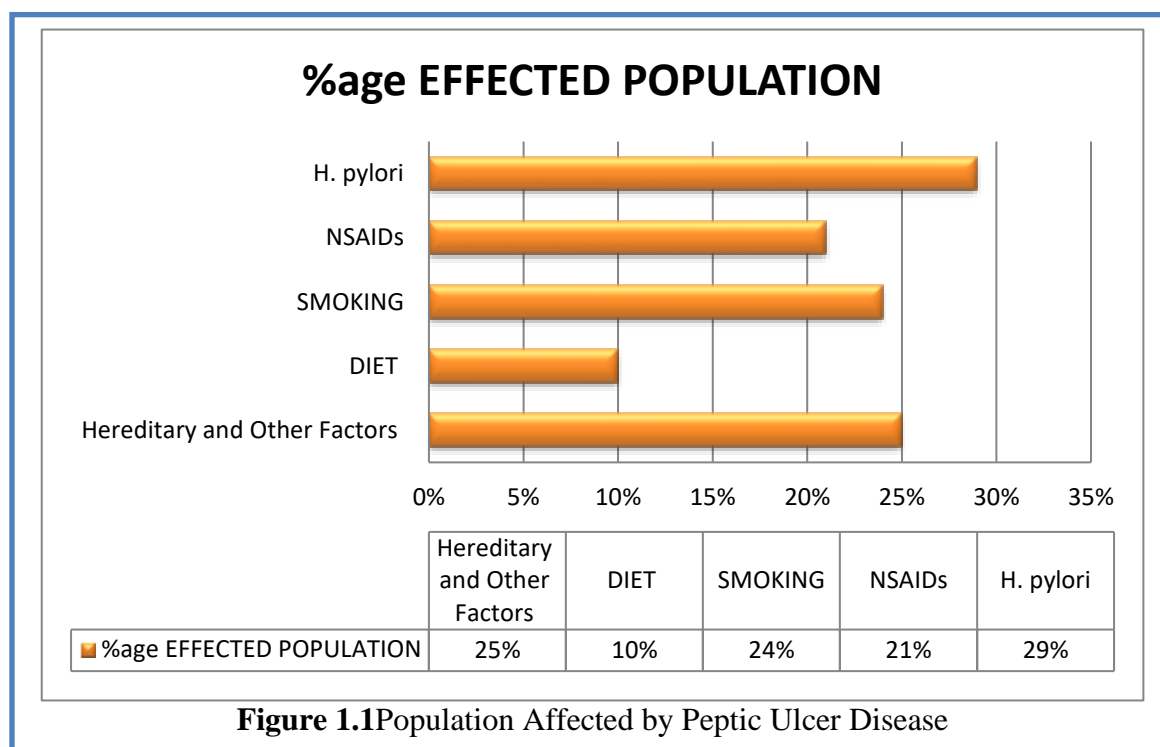


Figure 1.1 Population Affected by Peptic Ulcer Disease

PATHOPHYSIOLOGY

The stomach is comprised of three distinct layers: the Serosa, Mucosa, and Sub mucosa, which collectively constitute its structure. These layers play a crucial role in safeguarding and supporting the stomach by preventing direct exposure to gastric acid. At the pinnacle of these layers lies a protective mucosal covering that serves as a defense against the corrosive effects of Hydrochloric acid. A key focus is to address the factors that exert an influence on gastrointestinal (GIT) disorders. These factors encompass smoking, which is associated with heightened acid secretion; the release of gastric acid induced by alcohol consumption; ulcers triggered by nonsteroidal anti-inflammatory drugs (NSAIDs); and gastric acid production prompted by pepsin. While the stomach's layers are inherently safeguarded, an excessive surge in acid production coupled with a decline in pH levels [17] can lead to a decrease in stomach pH. This, in turn, initiates harm to the mucosal layer, followed by subsequent damage to the submucosa. Once the submucosa is compromised, further impairment extends to the serosa. The decline in pH not only impacts the stomach and its lining but also exerts

consequences throughout the entire gastrointestinal tract. The pathophysiology of peptic ulcers involves a complex interplay of various contributing factors, each contributing to the development of ulcerative lesions within the GIT. An illustration of these factors is presented in Figure 1.2 [18].

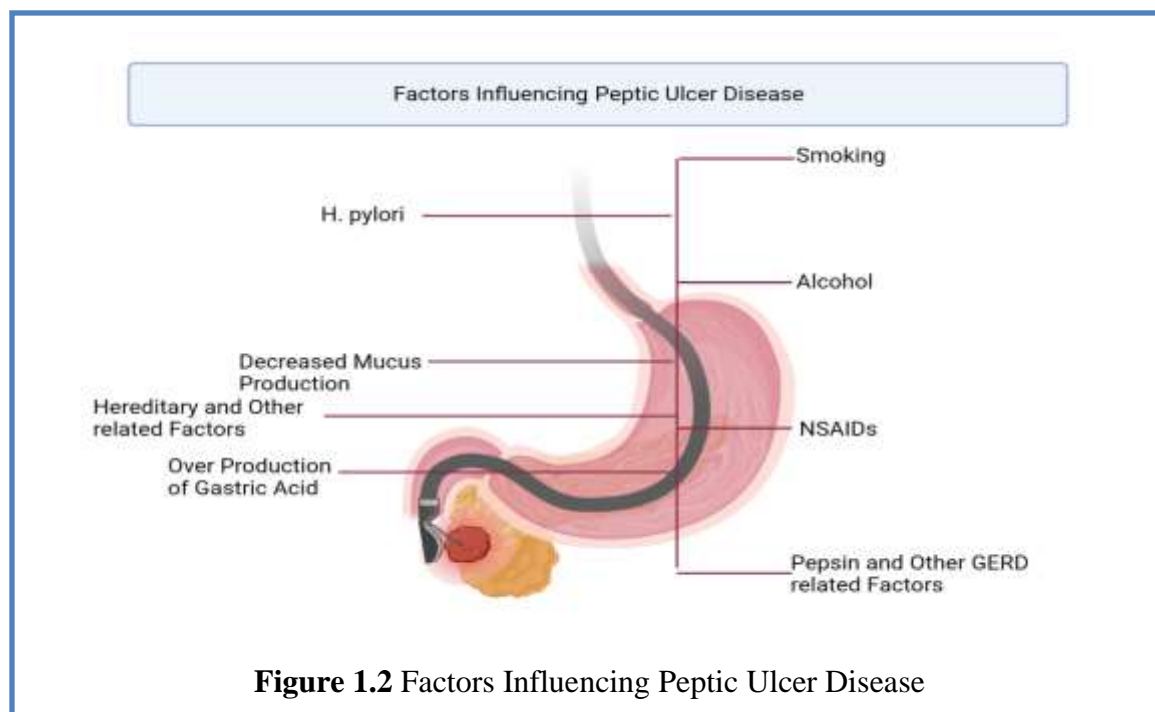
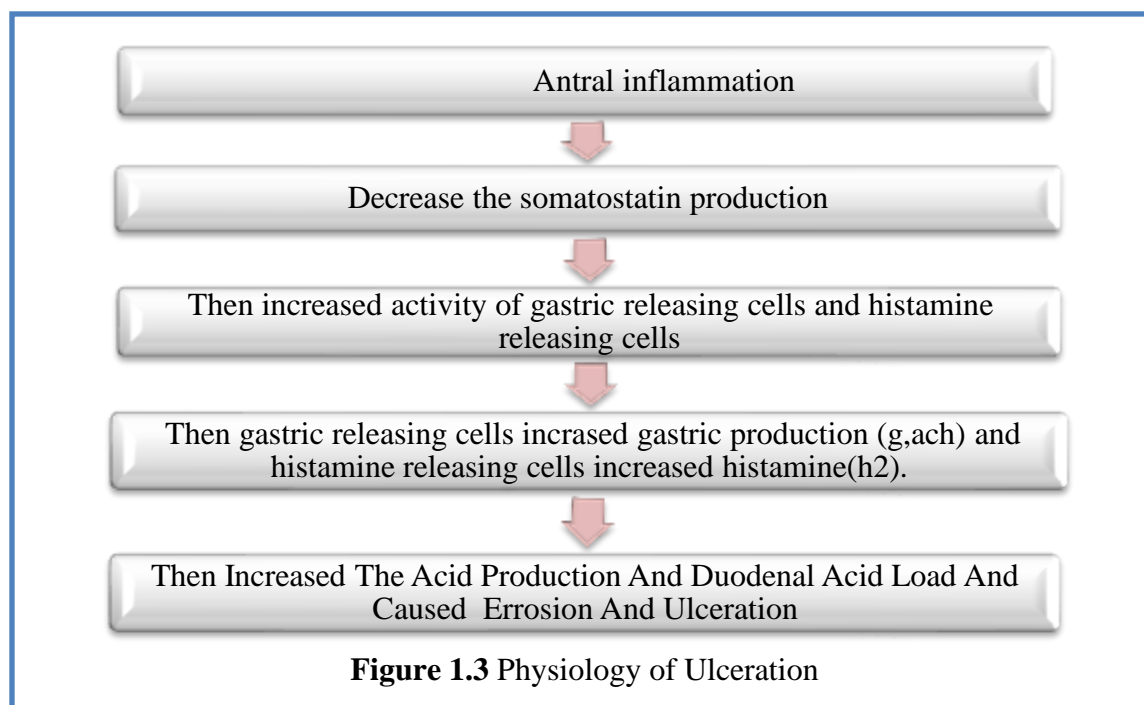


Figure 1.2 Factors Influencing Peptic Ulcer Disease

A collection of inflammatory conditions affecting the upper gastrointestinal (GI) tract collectively referred to as peptic ulcers necessitate the presence of acid and pepsin for their formation. Peptic ulcer disease is typified by inflammatory lesions in the mucosa and underlying structures of the upper GI tract, resulting in symptoms such as epigastric pain, diminished appetite, and weight loss. These ulcers materialize due to the compromised state of the mucous membrane, which usually safeguards the stomach, duodenum, and esophagus against the corrosive effects of gastric acid and pepsin [19]. The onset of these ulcers is often associated with helicobacter pylori infection, which contributes to the mucosal damage. While less frequent, esophageal ulcers can also emerge due to acid reflux [13, 16, 20].

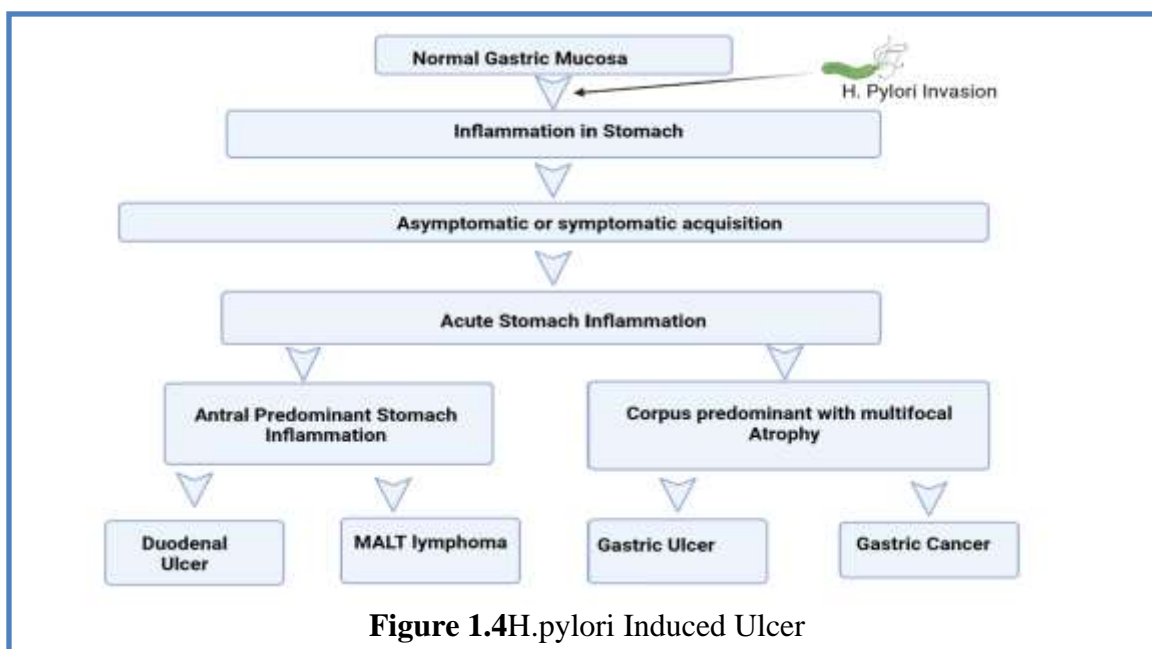
Typical ulcer symptoms encompass a burning sensation, abdominal discomfort, nausea, vomiting, loss of appetite, weight loss, and instances of ulcer bleeding [21]. Antral inflammation leads to a reduction in somatostatin production, subsequently increasing the activity of gastric release cells and histamine-releasing cells. Consequently, gastric release cells heighten the production of gastric (G) components, and histamine release cells augment histamine (H₂) release [22]. Both gastrin and histamine influence parietal cells, stimulating acid production. This surge in acid production elevates the duodenal acid load, culminating in erosion and the formation of ulcers [23]. To mitigate the side effects associated with allopathic or modern medicine, which can elicit notable adverse effects, peppermint oil is employed. Its use aids in minimizing side effects, primarily due to its better tolerance when utilized for ulcer treatment [24].



The Pepsin and more acid from the stomach are the usual culprits in peptic ulcer disease. Additionally, peptic ulcers are brought on by the gram-negative *H. pylori* bacteria. The helicobacter pylorus was identified as the principal cause of ulcers by Robin Warren and Barry J. Marshall in 1982. By blocking the COX pathway, a drug with NASID-like properties may result in a peptic ulcer [25]. In therapeutic studies, experimental animals have been employed, and both allopathic and herbal medications have shown observable results. The herbal mixture successfully treats ulcerative colitis. Comparatively, the current review describes the efficacy of treatments offered by both allopathic and ayurveda medicine [26].

ULCER INDUCED BY H.PYLORI

H. pylori, a type of gram-negative bacteria, serves as the underlying agent responsible for peptic ulcers. This bacterium secretes an enzyme called urease, which acts on urea, converting it into ammonia and bicarbonate [27]. The generated ammonia serves to neutralize the acidic pH within the stomach, thus creating a conducive environment for the organism's survival in this harsh milieu. Subsequently, *H. pylori* induces mucosal inflammation and impairs the integrity of mucosal cells, leading to the formation of a sore or ulcer [28].



Diagnostic Test H. pylori

➤ Noninvasive Procedures

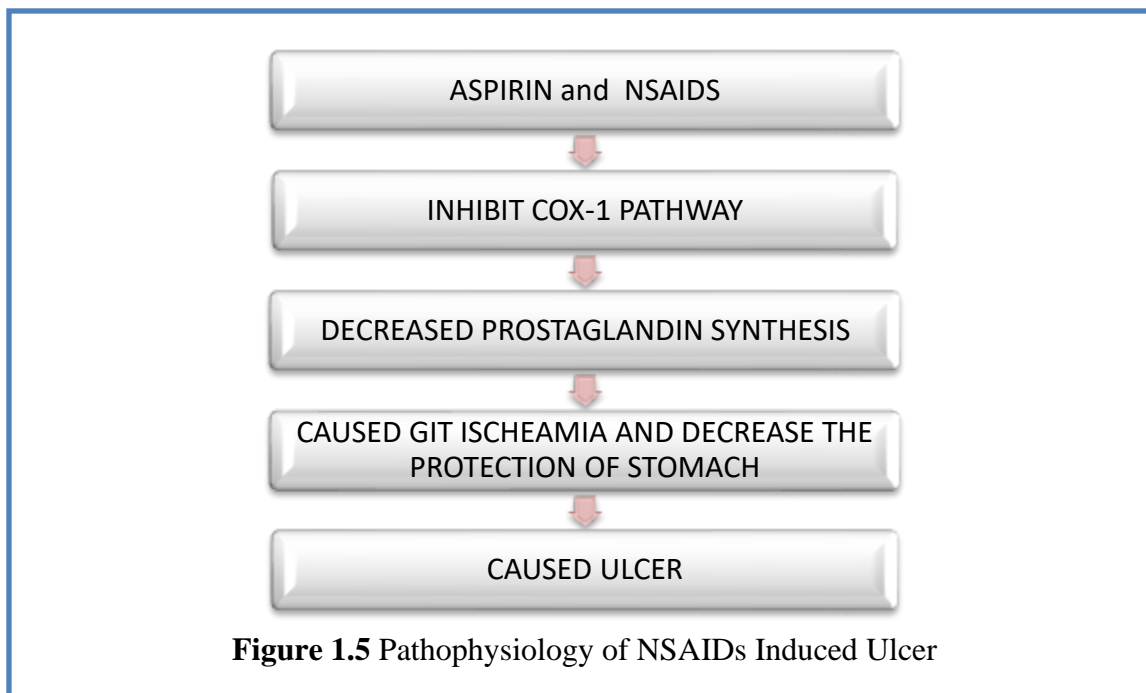
- **Serum or whole blood antibody tests:** Most easily used test for identification
- **Immunoglobulin G (IgG)**
- **Urea breath test**
- **Patient drinks a carbon-enriched urea solution**
- **Excreted carbon dioxide is then measured**

➤ Invasive tests

- **Biopsy of stomach:** By obtaining skin sample from the stomach cells.
- **Rapid urease test:** Most commonly used test based on pH which yields color change responsible for H. pylori invasion [29].

Ulcer induced by aspirin & NSAIDS:

Aspirin is categorized as a nonsteroidal anti-inflammatory drug (NSAID). NSAIDs operate by inhibiting the cyclooxygenase pathway, which subsequently reduces the production of prostaglandins [30]. Prostaglandins, through their interaction with the mucus membrane, stimulate an increase in mucus production. However, the use of NSAIDs interferes with this process, resulting in diminished mucus production. This compromised mucus production weakens the protective barrier against gastric acid. Consequently, the gastric acid comes into direct contact with the stomach lining, causing damage that ultimately gives rise to the development of an ulcer [31].



Comparison of Allopathic Medicine and Ayurvedic Medicine in Treatment of Peptic Ulcer

Peptic ulcers emerge due to a variety of factors, and medications address this condition by counteracting the excessive acid production in the stomach. The two primary medical frameworks engaged in managing peptic ulcers are Allopathic and Ayurvedic. The Allopathic approach involves disease treatment using chemicals, which, over an extended period, can result in adverse effects. Conversely, Ayurvedic medicinal practices often utilize powders derived from natural sources for treatment. The notable distinction lies in the fact that Ayurvedic remedies tend not to induce long-term side effects [32].

Allopathic drugs

In the context of ulcer-related ailments, these are commonly referred to as antiulcer agents, and the treatment involves administering specific chemicals aimed at shielding, diminishing, or aiding the recovery of the gastrointestinal tract (GIT) areas that have been affected due to an excessive generation of gastric acid [33].

Antacids		
The antacids are the elemental compounds that neutralize the excessive acid production. The antacid formulation which are marketed in the form of powder suspension and syrup are		
Sodium bicarbonate Crystalline compound soluble in water.	Magnesium hydroxide It is a liquid preparation of magnesium, also called "magnesium milk".	• Calcium carbonate It is a chemical compound very abundant in nature, both in inorganic matter, etc [34].
Side effects These drugs lead to quick gastric emptying time.		

<p>Anticholinergics These are the drugs that suppress the secretion of acid production in the stomach, GI movement, and stomach cramps. Acetylcholine is a neurotransmitter that acts on the M1 receptor and causes the parietal cells to secrete Gastric acid [35]. The anticholinergic drugs work against the functioning of acetylcholine on M1 receptor. The drugs used are:</p>		
<p>• Hyoscyamine It is an anticholinergic drug used to treat irritable bowel syndrome (IBS) and peptic ulcers. It controls muscle spasms, which can ease symptoms of IBS and allow for faster healing of ulcers. The drug is available in sublingual tablet formulation.</p>	<p>• Glycopyrrolate It is used to treat peptic ulcer disease. It is given in combination with other medicines.</p>	<p>• Chlordiazepoxide Clidinium is a benzodiazepine and also provide stomach relaxant properties. It is used to lower stomach acid in peptic ulcer disease. It is also used to treat problems of the intestines, like irritable bowel syndrome and enterocolitis, etc.</p>
<p>Side effects These drugs lead to Constipation, Dry mouth, Headache, Blurred vision [36].</p>		
<p>➤ H2 receptor antagonists These are the drugs which act on histamine receptor that leads to increase in acid production so these drugs bind on H2 receptor and decrease acid production. The drugs used are:</p>		
<p>• Cimetidine These are the drugs which are used to prevent peptic ulcer and it also causes the ulcer to not come back after once it is healed.</p>	<p>• Ranitidine It is an h2 blocker that works by reducing acid production. It also used to treat heartburn and other symptoms associated with the gastric acid disease.</p>	<p>• Famotidine It is an h2 blocker that works by reducing acid production. It also used to treat heartburn and other symptoms associated with the gastric acid disease.</p>
<p>Side effects These cause headaches, Dizziness, Constipation, and purities [37].</p>		
<p>➤ Proton Pump Inhibitors These are the antiulcer drugs that act by acting on the proton pump and inhibit the entry of protons which leads to decreased secretion of gastric acid inside GI. These are most commonly used in duodenal and esophageal ulcers.</p>		
<p>• Omeprazole It is PPI that acts in the stomach and GIT and causes the reduced release of gastric acid.</p>	<p>• Pantoprazole It is PPI that acts in the stomach and GIT and causes the reduced release of gastric acid. These are most commonly used in duodenal and esophageal ulcers.</p>	<p>• Esomeprazole It is PPI that act in Stomach and leads to decreased acid secretion by doing so the ulcer protective action has been seen.</p>
<p>Side Effects These cause headache, Dizziness, Constipation, and purities [38]</p>		

<p>• Ulcer Protective Drugs These are the drugs that mainly act by protecting action of there on the walls of GIT. The gastric ulcer when reaching to sub mucosa it leads to lesions and sometimes leads to bleeding so these drugs provide a covering to the damaged area. The main drug of choice is Sucralfate and Misoprostol.</p> <p>• Side Effects These drugs associated with Constipation and Diarrhea [39].</p>
<p>Ayurvedic Drugs These are the drugs which are obtained from Natural origin and used to treat ulcer by providing less acid production, healing the damaged area and not associated with severe side effects like allopathic drugs. The major disadvantage is it takes too long to cure disease.</p>
<p>➤ Bio Flavonoids These heal the peptic ulcer but some of the flavonoids found in Citrus fruits can also irritate the Ulcer. The formulation contains the bioflavonoid is</p> <p>• Yashtimadhu In this formulation, the licorice is taken with honey for thrice daily in a day for up to 1-3weeks but exact mechanism it is not known how it heals the stomach acid. It is considered that it cause basic environment in highly acidic situation which leads to peptic ulcer treatment [40].</p>
<p>• Kamadugha Rasayan It is considered that it have alkaline properties which aid the ulcer treatment more rapidly and contain remedies like Guduchisatva which aids to wound healing in stomach. This formulation comprise of poly herbal combination.</p> <p>• Side effects It can cause basicity in stomach if dosage is not well recommended which ultimately leads to digestion problem (41).</p>
<p>• Muktashukti Bhasma It is considered to have antiulcer properties by containing some salts that were linked to antacids. The main mechanism of action is considered similar to antacids. The ulcer protective and wound healing effect is by presence of polyherbal mixture along with aloe-vera gel.</p> <p>• Side effect The dosage should be monitored otherwise it will lead to diarrhoea and other digestion related disorders [42]</p>
<p>➤ Polyphenols Rich Food In recent studies, it has been proven that vitamins rich foods help to treat ulcer and also is due to the antioxidant property. The drugs used are Cabbage, Carrot juices, Cyanene paper [43].</p>

Comparison On the basis of Pharmacopoeia

The Ayurvedic Pharmacopoeia provides a comprehensive framework to address peptic ulcers through traditional herbal remedies and holistic strategies. This medicinal system underscores the significance of maintaining equilibrium among the body's internal energies (doshas) for overall well-being. In the context of peptic ulcers, Ayurveda places emphasis on the role of digestive fire (agni) and the harmonious balance of bodily humors [44]. Ayurvedic interventions for peptic ulcers primarily focus on alleviating inflammation, improving digestion, and restoring the integrity of the gastrointestinal tract. Formulations incorporate diverse herbs and natural substances that specifically target the underlying causes of ulcers. These blends often feature components such as licorice (yashtimadhu), Indian gooseberry (amalaki), neem, turmeric, and others renowned for their anti-inflammatory, antimicrobial, and curative attributes [45]. These interventions adopt a holistic perspective, encompassing dietary guidelines, lifestyle adjustments, stress management, and individualized herbal therapies. The objective is not solely to alleviate peptic ulcer symptoms, but also to address the foundational imbalances contributing to their emergence. The Ayurvedic methodology acknowledges the interconnectedness of mind, body, and spirit, striving to restore harmony across all dimensions of an individual's well-being. It is important to recognize that Ayurvedic treatments are tailored to the individual's distinct constitution (Prakriti) and imbalances (Vikriti). This personalized approach ensures that the treatment plan aligns with the individual's specific requirements, fostering optimal healing and overall health.

[46]. Ayurvedic Pharmacopeia for peptic ulcer treatment presents a holistic and natural strategy that incorporates herbal remedies, dietary adjustments, and lifestyle modifications to reinstate equilibrium and mitigate the fundamental causes of this condition. This approach encapsulates the essence of Ayurveda's age-old wisdom in promoting holistic wellness and healing. Nonetheless, consulting a qualified Ayurvedic practitioner before embarking on any treatment regimen is advisable [47].

The Allopathic Pharmacopeia offers a meticulously structured framework to address peptic ulcers, leveraging modern pharmaceutical interventions. Drawing from the latest medical research, clinical trials, and regulatory standards, this pharmacopeia outlines evidence-based strategies that are most effective for treating and mitigating peptic ulcer symptoms. The core of allopathic peptic ulcer treatments revolves around employing medications that directly target the overproduction of stomach acid, a pivotal contributor to ulcer development and exacerbation. Commonly prescribed medications encompass proton pump inhibitors (PPIs), histamine H₂-receptor blockers, antacids, and other relevant drugs. These pharmaceuticals are aimed at diminishing gastric acid secretion, alleviating symptoms, and fostering the healing of ulcerated tissues [48]. The Allopathic Pharmacopeia furnishes exhaustive insights into the mechanisms of action, appropriate dosages, administration protocols, potential side effects, and interactions associated with these medications. Its objective is to equip healthcare professionals with a comprehensive grasp of the available therapeutic choices, empowering them to make well-informed decisions tailored to the individual needs and circumstances of each patient [49]. Beyond medications, the pharmacopeia underscores the significance of harmonizing pharmaceutical interventions with lifestyle adaptations and dietary modifications to optimize treatment outcomes. It may provide guidance on dietary adjustments, techniques for stress management, and other lifestyle shifts that synergize with the medication regimen to expedite the healing process. The Allopathic Pharmacopeia's methodology is firmly rooted in evidence-based medicine, seeking to alleviate symptoms, stimulate ulcer healing, and avert complications linked with peptic ulcers. It mirrors the constant progressions in medical science and research, ensuring that healthcare practitioners remain equipped with the latest insights and directives to deliver effective care to peptic ulcer patients. Crucially, it's imperative to recognize that the Allopathic Pharmacopeia is an evolving document, consistently updated as fresh research emerges and medical knowledge advances. Healthcare professionals rely on this pharmacopeia as a dependable source for informed decision-making in peptic ulcer treatment. Those seeking relief from peptic ulcers should collaborate with qualified healthcare providers to receive well-suited guidance and recommendations based on the most current standards laid out in the Allopathic Pharmacopeia [50].

Discussion

When peptic ulcers coexist with gastro-intestinal reflux disease (GERD) breathing can become challenging. Recent research has demonstrated that the extended use of allopathic formulations like proton pump inhibitors (PPIs), for instance omeprazole, can lead to notable adverse effects. Findings from animal experiments have shown that NSAID-like medications, by inhibiting the COX pathway, can induce peptic ulcers [44-46]. Both allopathic and natural medications are emerging as potential remedies for peptic ulcers, showing promising effects. Herbal remedies prove effective in combating ulcerative ailments. The intriguing question arises about how both these therapies treat the same ailment with comparable therapeutic outcomes but via different mechanisms. Nevertheless, the fundamental principle in treating peptic ulcers centres on using fundamental agents to counteract highly acidic conditions [47-49]. Allopathic drugs have undergone substantial scrutiny due to the risks associated with long-term use, as documented by clinical trials and reports from agencies like the European Medicines Agency (EMA) [50-52]. In contrast, when examining clinical trial reports for Ayurvedic drugs, concise information about side effects tends to be lacking. However, comparing allopathic and Ayurvedic drugs in terms of safety and efficacy reveals that while Ayurvedic drugs are effective, their side effects remain unmodifiable. Consequently, allopathic drugs continue to be employed [53]. In the realm of allopathic drugs, an extensive range of side effects have been investigated, with new ones continually recorded through pharmacovigilance efforts each year. Thus, while Ayurvedic drugs are generally considered safe and effective, it is not a blanket guarantee for all situations [54-55]. As a result, a combination of Ayurvedic and allopathic drugs can be employed to deliver treatment with minimal adverse effects [56].

Conclusion

The core strategy in treating peptic ulcers is to diminish the production of stomach acid. Allopathic medications, despite their potential for strong reactions, play a substantial role in addressing peptic ulcers. In contrast, the traditional Ayurvedic system of medicine stands as a time-honored approach to treatment. This system employs various herbal preparations that offer multiple benefits. Notably, herbal formulations target several receptors implicated in stomach acid production, rendering them notably effective. Moreover, these formulations might enhance the production of mucus along the gastrointestinal tract (GIT) lining. Combining herbal formulations with allopathic treatments is a viable option. Drawing from the aforementioned investigation, it was ascertained that herbal remedies exhibit remarkable efficacy against peptic ulcers.

Abbreviation Used

GIT	- Gastro intestinal tract
NSAIDs	- Non Steroidal Anti Inflammatory Drugs
H.pylori	- Helicobacter pylori
COX	- Cyclo oxygenase pathway
M1 receptor	- Muscuranic Receptor
IBS	- Inflammatory Bowel Syndrome
PPI	- Proton Pump Inhibitors
GERD	- Gastro Oesophageal Reflux Disease
MOA	- Mechanism of Action

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