



Review Article

The Zingiber officinale Roscoe Combat H. Pylori Infection in human GIT Identification and Management

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ABSTRACT

Twenty years after the initial culture of HP, there has been a substantial change in the finding and treatment of upper gastroduodenal disease. A growing number of stomach cancers are caused by Helicobacter pylori infection, and researchers are also looking into how this infection affects other upper gastric tract inflammation. There has been significant progress in our understanding of the pathogenesis of this infection. Although there are powerful anti-microbial medications on the market, there is still no perfect treatment and the therapeutic indications are constantly evolving. Following the discovery of an HP infection, the clinician assesses the patient's clinical condition to determine whether therapy is necessary. Typically, HP eradication is suggested for the treatment and prevention of the infection. The microorganism that is introduced into the human stomach cancer that develops in the gastrointestinal tract causes the HP disease. In addition to gastrointestinal issues like belching, bloating, vomiting, indigestion, and constipation, it has been used for a long time to treat a variety of disorders. The purpose of the current study's findings was to assess how supplementing with ginger powder affected patients who had the HP infection's eradication and the relief of their dyspeptic symptoms.

INTRODUCTION

The stomach is the typical location for the negative gram, microaerophilic, spiral-shaped HP formerly recognized as HP [1]. It was assessed that more than 50% of the world's populace had HP in their upper digestive tracts, with colonization (or infection) occurring more frequently in developing countries [2]. Its helical form is thought to have developed through time to enable it to puncture the mucoid lining of the digestive tract and disseminate disease. The name "helicobacter" comes from this form. [3, 4] The bacterium was initially found in 1982 by the Australian physicians Robin, Barry, and Warren Marshall [5-7]. Extra nodal marginal zone lymphoma B-cell of the aforementioned organ, which is malignance of the (MALT) in the rectum, stomach, colon, esophagus, tissue soft around the eye, has been linked to Helicobacter Pylori (HP)

and in the lymphoid tissue of the intestines (diffuse lymphoma B-cell) [8]. Helicobacter Pylori that affects the first part of the small intestine [9]. A lot of theories have been put up by researchers that Helicobacter Pylori affects or guards against a wide range of diseases, although various of these relations are still up for debate. According to several studies, HP significantly affects the stomach's natural ecology, including the kinds of microbes that live there [9, 10] Further studies have suggested that non-pathogenic Helicobacter Pylori strains can regulate hunger by regulating stomach acid output [11].

Zingiber officinale Roscoe

One of the most well-liked therapeutic herbs in the entire globe is the ginger rhizome (Zingiber officinale Roscoe, family Zingiberaceae). It has been used for a long time to

treat a range of diseases, including gastrointestinal problems like belching, bloating, vomiting, indigestion, and constipation. Scientific research also supports some of its gastro-protective properties, such as the reduction of symptoms associated with dyspepsia. Additionally, according to the findings of certain experimental research, ginger administration appears to reduce *H. pylori* growth [12-16] and stop the development of stomach ulcers. As a result, the current study ginger supplementation powder on the elimination of HP and the amelioration of symptoms dyspeptic in HP-positive patients [12].

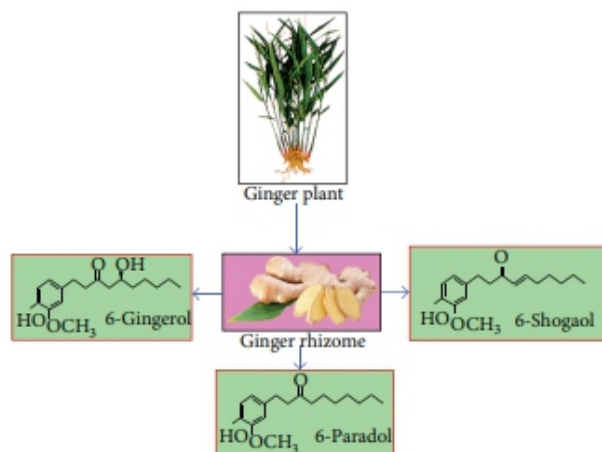


Figure 1: Zingiber officinale Roscoe [13]

Helicobacter Pylori Analysis Tests

Nonendoscopic: Blood tests, Breath tests, Stool tests

Endoscopic: Polymerase Chain Reaction, Histology, Rapid Urease Testing, Culture [14].

H. Pylori signs

Most persons with chronic gastritis or duodenitis don't show any symptoms. Duodenal or stomach ulcers are examples of more serious problems that some people deal with. The following are some of the most common ulcer signs and symptoms: Upper abdominal pain, bloating, Low blood counts, weariness, and feeling full after only a small quantity of food can all be symptoms of bleeding ulcers. Nausea, Lack of appetite and tarry stools [14].

H. Pylori Control

If a person has an infection with *Helicobacter Pylori*, they should get treatment if they have current stomach or duodenal ulcers or if they have a history of ulcer peptic disease. Successful *Helicobacter Pylori* treatment can reduce the risk of ulcer complications, stop recurrent ulcers, and hasten the healing process (like bleeding). These medicinal herbs, which include the ones listed below [15, 16], can help control H.P. ulcerative peptic disease.

Therapeutic herbs combat H. Pylori disease

There is antibiotic drug nominated at the following which is used for against *H. Pylori* disease.

Zingiber officinale Roscoe, family Zingiberaceae.

Patient with Helicobacter pylori Disease treatment and avoidance

To give a fresh strategy to treating HP infection and related diseases, it has taken a lot of work to develop efficient vaccinations. [17-19] At least in the Netherlands, it was discovered that the introduction of a potential HP vaccination for baby use was an affordable method of preventing stomach cancer [18, 19]. As of late 2019, there was just one vaccine in a vaccine which protects children from HP infection. Furthermore, the creation of a vaccination against HP is not being given great attention by significant pharmaceutical companies [20-21]. Studies show that when HP is entirely eliminated from the stomach, these therapies can reduce the inflammation of the infection and some histological abnormalities [22]. Similar debate surrounds the preventative effectiveness of antibiotic-based treatment plans for stomach cancer [23]. The incidence of the disease, however, significantly dropped after the bacterium was eradicated, according to two subsequent prospective studies on high-risk in Taiwan and China [24] as well as a meta-analysis that was also released in 2016 that included 24 studies on individuals with various levels of disease risk [25].

Type	Duration	Efficiency
First Line		
Standard Triple Therapy PPI+Two antibiotic (Clarithromycin+ Metrodiazole or amoxicillin)	7-14 days	70-85%
Second Line		
Bismuth +Quadrupole Therapy PPI+Bismuth salt+ Tetracycline+Metronidazole	14 days	75-90%
PPI+Clarithromycin+ amoxicillin+Methronidazole levofloxane. Triple Therapy PPI+Amoxicillin+ Levofloxacin	14 days	74-71%
Salvage regimen		
Rifabutin based therapy PPI+Rifabutin+amoxicillin	10 days	66-70%

Table 1: H. Pylori Treatment Medication List

Concerns with H. Pylori risk

Most likely, *H. pylori* spreads by the consumption of feces-contaminated food or drink. HP (the initial part of the intestine tiny) (the first part of the intestine small) The bacterium infects the protective tissue lining the gastrointestinal. This results in the release of particular enzymes and poisons as well as the activation of the immune system [26].

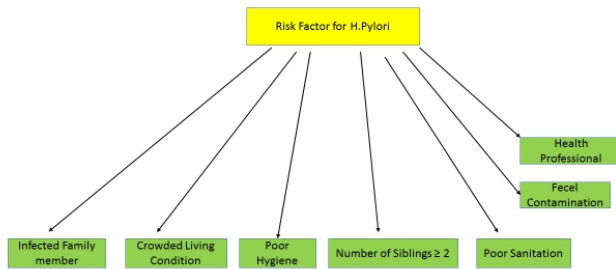


Figure 2: Risk Factor for H. Pylori

H. Pylori infection Human to human transmission

H. Pylori is contagious Oral-oral contact, such as fecal-oral contact, kissing, are the most likely routes of transmission. [27, 28] Some of the infected people's faeces, saliva, and tooth plaque have been found to be free of the bacteria, which is consistent with these possible transmit channels. H. pylori spreads more easily through stomach mucous than through saliva, according to studies [29]. Transmission often occurs within families in wealthy nations, while it can also spread through public contact in less developed ones [30-31]. A clean atmosphere may help lower the incidence of HP infection. HP can also spread orally through faeces when people drink water that has been contaminated with excrement [29].

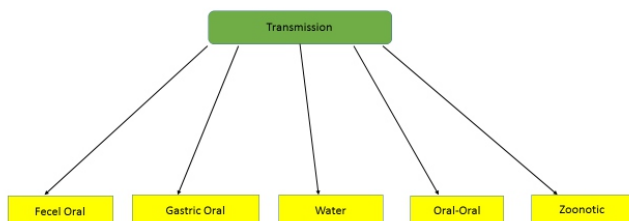


Figure 3: H. Pylori Transmission [14].

DISCUSSION

Stomach cancer is the third most prevalent cancer-related cause of passing universal. The goal of this appraisal is to summarize the numerous elements that contribute to the slow transformation of healthy gastrointestinal tissue into gastric cancer. This evaluation helps medical personnel identify infected persons who have a high risk of getting stomach cancer and perform the necessary examinations and treatments on them [32]. This review will concentrate on the most HP infection, including oxidative stress autophagy, endoplasmic reticulum stresses, inflammation, the unfolded protein response. This review will also highlight new Therapeutic possibilities for non-invasive risk control in stomach cancer [33]. There are several important issues that need to be clarified about the relationship between HP and stomach cancer. Three of them are the subject of this article: (1) the explanation for why H. pylori infection, which results in inflammation of both the stomach and the duodenum, is solely linked to gastric cancer [34]. If H. pylori treatment is given to

someone who has first-degree relatives who have had the disease, their risk of developing stomach cancer may be reduced, but this is not known [35]. Inflammatory tumors caused by HP infection account for the bulk of stomach cancers. Due to epigenetic changes and DNA damage, HP has also been linked to neoplastic transformation and genetic instability. Vomit, stool, and saliva are the primary ways that H. Pylori is passed from one person to another. Water, food, and other sources may be contaminated with H. Pylori [36]. However, there is inadequate evidence to support the claim that flies exposed to human faeces carrying H. pylori can transmit the infection to humans. The notion is intriguing, though, because flies are known to transmit a variety of other infectious diseases. The spread of HP is crucial for halting the spread of the infection. This is especially true in areas where stomach cancer, stomach ulcers, and gastrointestinal lymphoma are prevalent [37]. SThe disease will probably pass from person to person, especially within the same family, even though the exact route of transmission is unknown. Environmental contamination is another potential. Reinfection from an effective eradication therapy nearly never happens, and eradication without a precise therapeutic regimen is extremely rare. The chance of reinfection will increase if there are affected family members [38]. Disease is most often passed from person to person, though there is a risk of transmit by an external source, such the water supply. Arguments for and against faecal-oral, oral-oral, and gastric-oral transfer have been offered [39]. In people with functional dyspepsia and HP positive, they were to assess the effects of supplementing with ginger Ginger powder on the removal of HP and the amelioration of dyspeptic symptoms (FD). According to our research, Z. officinale is an effective FD supplementary treatment. However, due to the lack of clinical trials in this field, more meticulously conducted clinical trials are necessary in order to properly examine its efficacy, particularly with relation to the eradication of HP [40]. In addition to a total of 48 "statements" and associated 6 components, the HP infection in specific populations, gastric cancer, eradication, diagnosis, and treatment, and gastrointestinal microbiota are all covered [41]. It is contagious to have HP infection. Given the alarmingly developing drug resistance in HP, gastroenterologists should abandon the empiric HP treatment paradigm in favour of antibiotic susceptibility testing-guided precision treatment. Local, regional, and national antimicrobial stewardship programmes for H. pylori should be developed to monitor the pattern of antibiotic resistance [42]. Experimental research has demonstrated that the active ingredients in ginger, such as 6-gingerol and 6-shogaol, have anticancer properties that are effective against GI cancer. Ginger's capacity to

regulate multiple signaling molecules, including NF- κ B, STAT3, MAPK, PI3K, ERK1/2, Akt, TNF-, is thought to be the cause of its anticancer properties. Other proteins that control cell proliferation include COX-2, cyclin D1, cdk, MMP-9, survivin, cIAP-1, XIAP, Bcl-2, and caspases. Here's a review, using in vitro studies to demonstrate the chemo preventive and chemotherapeutic effects of ginger extract and its constituent ingredients Patients and animal models have both been mentioned [43]. As an alternative, this study provides a well referenced perspective on herbal treatments for H. pylori, emphasizing the use of nanotechnology in creating fresh methods for treating H. pylori infection[44].

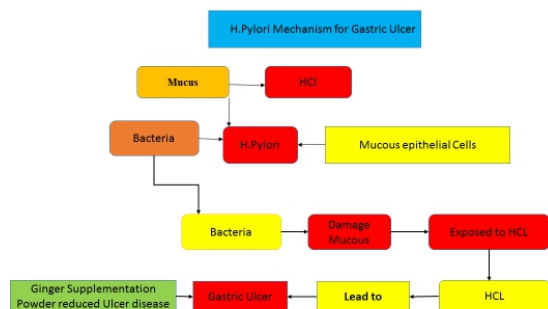


Figure 4: H. Pylori Mechanism for Gastric Cancer

CONCLUSIONS

HP infection is still one of the most common and persistent bacterial diseases in the world. There are many options for diagnosing infection and determining eradication following HP infection therapy. Additionally, different therapies are used as forms of treatment. Although HP may not be the only factor in these conditions, the organism is responsible for 70% to 90% of them. As long as oral-oral and fecal-oral transmission methods are still used, it is crucial to maintain environmental cleanliness and make sure that municipal water and food are safe to eat before consumption. In addition to gastrointestinal problems like belching, bloating, vomiting, indigestion, and constipation, it has been used for a long time to treat a variety of disorders. The current study's findings were to assess how supplementing with ginger powder affected patients who had the HP infection's eradication and the relief of their dyspeptic.

Conflicts of Interest

The authors declare no conflict of interest

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