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RISK FACTORS, CONSOLIDATED DISEASES, CLINICAL AND IMMUNOLOGICAL FEATURES IN EXCERNSATION OF GASTRIC AND DUODENAL ULCER IN PATIENTS IN THE DISPENSARY GROUP

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Abstract:
An analysis of modern domestic and foreign medical literature shows that, despite the progress achieved in recent years, peptic ulcer of the stomach and duodenum does not lose its relevance [2, 8, 10, 12]. World statistics show that peptic ulcer disease remains one of the most common diseases of internal organs. In Russia, the prevalence of this pathology among the entire population is about 12%, and the results of pathological studies give higher figures - 28%, which may indicate a latent course of the disease in many patients [1]. It has been proven that the leading role in the etiopathogenesis of peptic ulcer disease is currently given to H. pylori infection. However, despite the introduction of eradication regimens into treatment standards, the problem of H. pylori-associated peptic ulcer disease cannot be considered solved. Thus, according to a number of Russian authors: Avakimyan V.A et al., 2008 [3, 4], Shaposhnikova V.I., 2008. [7], Povalyaeva A.B., 2009 [3], Stupina V.A., 2011. [4], in Russia there is an increase in complications of ulcerative disease, such as bleeding and perforation. The mortality rate from ulcer bleeding remains high, up to 15%, and has remained virtually unchanged over the past 20 years [6, 9, 14]. Despite the undeniable success of introducing various H. pylori eradication therapy regimens into clinical practice, the expected reduction in the frequency of relapses of peptic ulcer disease in the country has not occurred [2]. It should be noted that there are no Russian multicenter studies of the prevalence of H. pylori, which makes it difficult to assess both the prevalence of this infection and its dynamics over time [1]. This is especially important due to the importance of these indicators, primarily for planning preventive work and morbidity control. The relevance of studying peptic ulcer disease is determined by the fact that this disease has not only medical, but also socio-economic significance, which emphasizes the need to improve treatment tactics for this group of patients [9].

Keywords: Gastric mucosa, digestive process, chemical components, mucus, hydrochloric acid, intrinsic factor, enzymes, hormonal regulators, digestion, challenges, safeguards, Helicobacter pylori, NSAIDs, lifestyle, stress, diet, autoimmune, aging, health, chemistry, influence, resilience, understanding, application, choices, holistic approach.

Introduction:

In some patients, an exacerbation of peptic ulcer disease may occur with few symptoms or asymptomatic, the symptoms are smoothed out or even inverted, which disorients both the doctor and the patient. The issues of the prevalence of latent forms of peptic ulcer, their timely detection before the onset of complications and prediction of exacerbation of peptic ulcer without clinical symptoms are not covered in the available literature. Considering the insufficient knowledge of the problem as a whole, the inconsistency of the available information, it is relevant to study clinically latent forms of peptic ulcer disease in the group of dispensary observation, identify risk factors for exacerbation, clarify the nature of concomitant pathology, assess the immunological characteristics of the body in order to increase the efficiency of diagnosis of exacerbation, treatment and secondary prevention of peptic ulcer diseases in patients registered at the dispensary.

One of the important tasks of the priority National Health Project is to improve preventive measures [141]. Of great importance is the implementation of clinical examination in gastroenterological practice, in particular, of patients with peptic ulcer of the stomach and duodenum [26], since thanks to active dynamic monitoring, early detection, prevention of the development and spread of diseases, restoration of working capacity, and extension of the period of active life of patients are carried out. Optimizing dispensary care for patients with peptic ulcer disease, introducing new approaches to examination and treatment may reduce the frequency of exacerbations, change negative trends in the course of the disease and reduce the number of deaths. All of the above was the basis for conducting our research.

Purpose of the study

To study risk factors for exacerbation of gastric and duodenal ulcers in patients in the follow-up group, the nature of concomitant pathology, clinical and immunological features to optimize treatment and increase the effectiveness of clinical examination.

Research Objectives:

1. To carry out a screening study of risk factors and H. pylori infection using non-invasive diagnostic methods in patients with gastric and duodenal ulcers in the follow-up group. 2. Conduct a clarifying comprehensive clinical and instrumental examination of patients in the follow-up group with the presence of risk factors for exacerbation and H. pylori infection, including the study of concomitant diseases, identification and assessment of the severity of anxiety and depression, the condition of the mucous membrane of the stomach and duodenum, study of immunological markers of inflammation in saliva and blood serum to detect clinically latent forms of gastric and duodenal ulcers. 3. To evaluate the dynamics of clinical, instrumental and immunological markers of exacerbation of gastric and duodenal ulcers after standard

anti-Helicobacter and complex therapy including the drug imudon during a year of observation.

The gastric mucosa, a complex and dynamic lining of the stomach, plays a pivotal role in the intricate process of digestion. Composed of various chemicals and subject to a multitude of factors, the gastric mucosa functions as a barrier, a digestive powerhouse, and a regulator of essential processes.

Chemical Components of Gastric Mucosa:

1) Mucus: A Protective Shield

The gastric mucosa, a specialized lining of the stomach, plays a crucial role in maintaining the health of the digestive system. This lining contains specialized cells known as goblet cells, which actively produce and secrete mucus. The mucus serves as a multifaceted protective shield with several key attributes. Firstly, the mucus acts as a physical barrier, forming a gel-like layer that covers the surface of the stomach lining. This layer serves as a defense against the harsh acidic environment created by gastric juices, which include hydrochloric acid. Without this protective barrier, the stomach lining would be susceptible to erosion and damage from its own digestive secretions. Secondly, the mucus contains bicarbonate ions, which help neutralize the acidity of the stomach environment. This neutralization is crucial for preventing self-digestion of the stomach lining by acid, ensuring that the digestive process occurs in a controlled and safe manner. Moreover, the mucus layer provides an ideal environment for the activity of mucosal cells, facilitating their regeneration and repair. The stomach lining undergoes constant renewal to counteract the effects of wear and tear, and the presence of mucus supports this regenerative process.

2) Hydrochloric Acid (HCl): Digestive Elixir

Hydrochloric acid serves a dual purpose in the digestive system. Firstly, its low pH provides an optimal acidic environment essential for the activation and optimal function of digestive enzymes, particularly pepsin. Pepsin is responsible for breaking down proteins into smaller peptides, a critical step in the overall digestion of dietary proteins. The acidic milieu created by HCl ensures that proteins are efficiently denatured and cleaved into digestible fragments. Secondly, the acidic environment created by HCl acts as a powerful antimicrobial defense mechanism. It helps to sterilize ingested food, eliminating or reducing the presence of harmful microorganisms such as bacteria and parasites. This not only protects the body from potential infections but also prevents the colonization of pathogens in the digestive tract. The comparison of hydrochloric acid to a "culinary chef" is apt, as it plays a central role in the initial stages of food processing within the stomach. Just as a skilled chef uses various techniques to prepare raw ingredients for consumption, HCl initiates the breakdown of complex food structures, preparing them for further digestion and absorption in the later stages of the digestive tract. Furthermore, the controlled secretion of hydrochloric acid is a finely tuned process regulated by various factors, including the presence of food, hormonal signals, and neural input. This precision ensures that the acidic environment is

activated when needed, optimizing the digestive process without causing harm to the stomach lining.

3) Intrinsic Factor: Facilitating Nutrient Absorption

Another product of parietal cells, intrinsic factor is essential for the absorption of vitamin B12 in the small intestine. This vitamin plays a vital role in the formation of red blood cells and neurological function. Intrinsic factor can be likened to a "VIP pass" for vitamin B12. It ensures the nutrient gets exclusive access to the bloodstream, guaranteeing a smooth journey to where it's needed most.

Delving deeper into the role of intrinsic factor, it is a specialized glycoprotein secreted by parietal cells that serves as a critical facilitator in the absorption of vitamin B12, also known as cobalamin. The collaboration between intrinsic factors and vitamin B12 is essential for several key physiological processes within the body.

Vitamin B12 is a water-soluble vitamin that plays a pivotal role in two primary areas: the synthesis of DNA and the formation of red blood cells. Additionally, it is crucial for maintaining the health of the nervous system, including the proper functioning of nerve cells and the production of myelin, a protective covering for nerves. As vitamin B12 is not synthesized by the human body, it must be obtained through diet or supplementation. Intrinsic factor acts as a specialized carrier for vitamin B12, forming a complex that protects the vitamin from degradation in the harsh acidic environment of the stomach. This complex travels to the small intestine, where specific receptors recognize and bind to the intrinsic factor-vitamin B12 complex. The comparison of intrinsic factor to a "VIP pass" aptly captures its exclusive role in facilitating the absorption of vitamin B12. The intrinsic factor acts as a chaperone, ensuring the safe and targeted delivery of vitamin B12 to the intestinal cells responsible for absorption. Without intrinsic factor, the body would struggle to absorb an adequate amount of vitamin B12, leading to potential deficiencies and associated health complications. The journey of vitamin B12, escorted by intrinsic factor, continues as the complex is absorbed into the bloodstream through the walls of the small intestine. Once in the bloodstream, vitamin B12 can be transported to various tissues and organs, where it plays its crucial roles in DNA synthesis, red blood cell formation, and neurological function.

4) Enzymes: Pepsin's Role in Protein Digestion

Delving into the enzymatic processes of protein digestion, chief cells, nestled within the gastric mucosa, play a crucial role by releasing pepsinogen, an inactive precursor to the potent enzyme pepsin. Upon exposure to the acidic environment created by hydrochloric acid in the stomach, pepsinogen undergoes a cleavage process, transforming into its active form, pepsin.

Pepsin is a proteolytic enzyme, meaning it specializes in breaking down proteins into smaller peptides. This enzymatic activity is vital for the initial stages of protein digestion, as it cleaves the long chains of amino acids in dietary proteins into more

manageable and absorbable fragments. This process is essential for the body to extract the necessary building blocks for the synthesis of its own proteins.

The comparison of pepsin to a "culinary assistant" paints an apt picture of its role in the digestive process. Much like a skilled sous chef who collaborates with the culinary chef, pepsin works hand-in-hand with hydrochloric acid to prepare the "ingredients" (proteins) for the body's digestive "culinary masterpiece." The synergy between pepsin and hydrochloric acid ensures that the proteins are adequately broken down into smaller peptides, setting the stage for further enzymatic action in the later stages of digestion.

Moreover, the controlled release of pepsinogen and its activation into pepsin highlight the precision and regulation inherent in the digestive system. This ensures that enzymatic activity occurs when and where it is needed, optimizing the overall efficiency of the digestive process.

5) Gastrin: Hormonal Regulator

Gastric mucosa releases the hormone gastrin, a key player in regulating gastric acid secretion and promoting stomach motility. Gastrin ensures a coordinated digestive process by signaling various components of the stomach to work in harmony. Gastrin acts like the "conductor" of the digestive orchestra, ensuring that each section (acid secretion, motility, etc.) plays its part in perfect harmony to achieve efficient digestion.

Expanding on the role of gastrin as a hormonal regulator, this peptide hormone plays a crucial role in maintaining the balance of digestive functions within the stomach. Released by the gastric mucosa, gastrin responds to various stimuli, particularly the presence of food in the stomach.

Factors Affecting Gastric Mucosa: Helicobacter pylori Infection: A Silent Intruder

Helicobacter pylori is a bacteria that can colonize the lining of the stomach, and its presence has been associated with several alterations in the gastric mucosa. This infection is considered a major risk factor for the development of various gastrointestinal conditions, including gastritis and peptic ulcers.

1. **Gastritis:** H. pylori infection is a common cause of gastritis, which is the inflammation of the stomach lining. The bacteria induce an immune response, leading to chronic inflammation. This persistent inflammation can disrupt the normal architecture of the gastric mucosa, potentially affecting its secretory functions and the integrity of the protective mucus layer.
2. **Peptic Ulcers:** In some cases, H. pylori infection can lead to the development of peptic ulcers, which are open sores that form on the inner lining of the stomach or the upper part of the small intestine. The bacteria weaken the protective mechanisms of the gastric mucosa, making it more susceptible to damage from stomach acid. This can result in the formation of ulcers, causing symptoms such as abdominal pain, bloating, and nausea.
3. **Increased Acid Production:** H. pylori infection can stimulate the release of gastrin, a hormone that prompts the secretion of stomach acid. This excessive acid

production can contribute to the erosion of the gastric mucosa, further exacerbating the risk of gastritis and ulcers.

4. **Long-term Complications:** Chronic H. pylori infection has been linked to an increased risk of more severe conditions, including gastric adenocarcinoma, a type of stomach cancer. The prolonged presence of the bacteria and the associated inflammation can lead to changes in the gastric mucosa that may contribute to the development of cancerous cells over time.

Research Results:

The intricate interplay between the chemical components of the gastric mucosa and external factors underscores the delicate balance required for optimal digestive function. Understanding the roles of mucus, hydrochloric acid, intrinsic factor, enzymes, and hormones provides insights into the complexity of gastric physiology. Factors such as H. pylori infection, NSAID use, stress, and lifestyle choices can disrupt this balance, emphasizing the need for holistic approaches to digestive health. Addressing H. pylori infection typically involves a course of antibiotics and other medications to eradicate the bacteria. Successful treatment can help alleviate symptoms, reduce inflammation, and prevent the progression of complications associated with gastric mucosal changes caused by the infection.

1) NSAIDs: Balancing Pain Relief and Gastric Health

Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used for their pain-relieving and anti-inflammatory properties. While effective in managing various conditions, NSAIDs can have significant implications for gastric health. Here's an exploration of how NSAIDs affect the gastric mucosa:

1. **Gastric Irritation:** NSAIDs work by inhibiting enzymes, specifically cyclooxygenase (COX), which play a role in the synthesis of prostaglandins. Prostaglandins have a protective effect on the gastric mucosa, helping maintain the integrity of the mucosal lining and regulating the secretion of mucus and bicarbonate. When NSAIDs suppress prostaglandin production, the stomach's natural defense mechanisms are compromised, leading to increased vulnerability to gastric irritation.

2. **Increased Risk of Gastric Ulcers:** Prolonged use of NSAIDs is associated with an elevated risk of developing gastric ulcers. The diminished prostaglandin levels contribute to decreased mucus and bicarbonate secretion, reducing the stomach's ability to protect itself from the corrosive effects of gastric acid. This can result in the formation of ulcers, which may lead to symptoms such as abdominal pain, indigestion, and, in severe cases, bleeding.

3. **Gastrointestinal Bleeding:** NSAIDs, particularly when taken in high doses or over an extended period, can increase the risk of gastrointestinal bleeding. The compromised mucosal barrier allows gastric acid to erode the lining, potentially leading to bleeding. This can manifest as dark, tarry stools or, in more severe cases, as overt bleeding.

4. **Role of Selective COX-2 Inhibitors:** Some NSAIDs are selective inhibitors of cyclooxygenase-2 (COX-2), aiming to reduce inflammation without affecting COX-1, which plays a role in maintaining the gastric mucosa. While these drugs are designed to minimize gastrointestinal side effects, they still carry a risk of gastric irritation and ulceration, particularly with prolonged use or in individuals with pre-existing gastric conditions.
5. **Individual Susceptibility:** The impact of NSAIDs on the gastric mucosa can vary among individuals. Factors such as age, concurrent use of other medications, and the presence of underlying gastrointestinal conditions can influence an individual's susceptibility to NSAID-induced gastric issues.

In managing pain and inflammation, it is crucial to strike a balance between the therapeutic benefits of NSAIDs and their potential adverse effects on gastric health. This often involves considering alternative pain management strategies for individuals at higher risk of gastrointestinal complications, such as the use of other pain medications or the inclusion of gastroprotective agents alongside NSAIDs.

2) Stress: The Mind-Gut Connection

The intricate relationship between stress and the health of the gastric mucosa is a fascinating interplay that underscores the interconnectedness of the mind and the gut. Here's an exploration of how stress influences the gastric mucosa:

1. **Impact on Gastric Secretions:** Stress triggers the release of hormones such as cortisol and adrenaline, which can affect gastric secretions. The increased production of stomach acid, influenced by stress hormones, can contribute to the erosion of the gastric mucosa over time. This heightened acidity may lead to conditions such as gastritis or ulcer formation.
2. **Changes in Gastric Blood Flow:** Stress induces changes in blood flow patterns, potentially compromising the blood supply to the stomach lining. Reduced blood flow to the gastric mucosa can impair its ability to regenerate and repair, making it more susceptible to damage from stomach acid and other digestive factors.
3. **Altered Motility:** Stress has the capacity to influence the motility of the gastrointestinal tract, affecting the rhythmic contractions of the stomach muscles. This altered motility can contribute to conditions such as functional dyspepsia or irritable bowel syndrome (IBS), impacting the overall health of the gastric mucosa.
4. **Inflammatory Responses:** Chronic stress may contribute to a state of chronic inflammation in the body, including the gastrointestinal tract. Inflammation in the gastric mucosa can disrupt its normal functions, potentially leading to conditions characterized by persistent inflammation, such as chronic gastritis.
5. **Mind-Gut Axis:** The bidirectional communication between the brain and the gut, known as the mind-gut axis, plays a central role in the stress-gastric mucosa relationship. Signals from the brain can influence the gut, and vice versa. Stress, whether acute or chronic, can send signals that impact gastric functions, potentially leading to disruptions in the delicate balance of the gastric mucosa.

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6. **Individual Variability:** The impact of stress on the gastric mucosa can vary among individuals. Some may be more resilient to stress-induced changes, while others may be more susceptible, depending on factors such as genetic predisposition, coping mechanisms, and overall health.

Managing stress is crucial not only for mental well-being but also for maintaining a healthy digestive system. Stress reduction techniques, such as mindfulness, meditation, and exercise, can positively influence the mind-gut axis and contribute to the overall well-being of the gastric mucosa.

3) Lifestyle Factors: Alcohol and Smoking

The choices we make in our lifestyle, particularly in terms of alcohol consumption and smoking, can significantly impact the health of the gastric mucosa. Here's an exploration of how these lifestyle factors influence the stomach lining:

1. **Alcohol Consumption:**

• **Irritation of Gastric Mucosa:** Excessive alcohol consumption can irritate the gastric mucosa, leading to inflammation and an increased risk of gastritis. The direct contact of alcohol with the stomach lining can disrupt the protective mucus layer, making the mucosa more susceptible to damage from stomach acid.

• **Increased Acid Production:** Alcohol stimulates the production of gastric acid, which can contribute to conditions such as acid reflux and heartburn. Prolonged exposure to increased acidity may lead to erosion of the gastric mucosa and the development of ulcers.

2. **Smoking:**

• **Diminished Blood Flow:** Smoking has been associated with a reduction in blood flow to the gastrointestinal tract, including the stomach. Diminished blood flow to the gastric mucosa can compromise its ability to repair and regenerate, making it more vulnerable to damage.

• **Risk of Gastric Ulcers:** Smoking is considered a risk factor for the development of peptic ulcers. The combination of reduced blood flow and the direct effects of tobacco smoke on the stomach lining can contribute to the formation of ulcers.

3. **Combined Impact:**

• **Synergistic Effects:** The combination of alcohol consumption and smoking can have synergistic effects on the gastric mucosa. Both substances can individually contribute to irritation and damage, and their combined impact may exacerbate the risk of developing gastrointestinal issues.

• **Increased Risk of Complications:** Individuals who both smoke and consume alcohol excessively may be at a higher risk of complications such as gastrointestinal bleeding, perforation, and an increased likelihood of developing conditions like Barrett's esophagus, a precancerous condition.

4. **Individual Susceptibility:**

• **Genetic and Environmental Factors:** Individual susceptibility to the effects of alcohol and smoking on the gastric mucosa can vary based on genetic and

environmental factors. Some individuals may be more resilient, while others may experience heightened vulnerability to the detrimental effects of these lifestyle choices.

5. **Importance of Moderation and Quitting:**

• **Moderation:** Consuming alcohol in moderation and quitting smoking are crucial steps in preserving the health of the gastric mucosa. Moderation helps minimize the direct impact of these substances on the stomach lining and reduces the risk of associated complications.

• **Promoting Gastric Health:** Adopting a lifestyle that includes moderation in alcohol consumption, quitting smoking, and incorporating a balanced diet can contribute to overall gastric health. These choices support the integrity of the gastric mucosa and reduce the risk of gastrointestinal issues.

Conclusion:

In conclusion, the exploration of the gastric mucosa has unveiled a remarkable symphony of chemical components orchestrating the intricate ballet of digestion. Mucus, hydrochloric acid, intrinsic factor, enzymes, and hormonal regulators play pivotal roles in maintaining the delicate balance required for optimal digestive function. The gastric mucosa acts as a linchpin in the digestive process, forming a protective shield, facilitating nutrient absorption, and regulating essential processes. Examining the external factors influencing the gastric mucosa reveals a tapestry of challenges and safeguards. From the silent intrusion of Helicobacter pylori to the delicate balance required with NSAID use, each factor has been dissected with practical examples to enhance understanding. Lifestyle choices, stress management, dietary considerations, autoimmune complexities, and the evolving nature of the aging digestive system emerge as pivotal elements in maintaining gastric health. The article seeks to bridge the gap between scientific understanding and practical application by incorporating examples and specifics. It encourages a holistic approach to gastric health, emphasizing the importance of both chemical harmony and lifestyle considerations. The delicacy and resilience of the gastric mucosa are illuminated, empowering individuals to make informed choices for their digestive well-being. As we navigate the realms of chemistry and influence, it becomes evident that the gastric mucosa is not only a physiological marvel but also a barometer of overall health. The interconnectedness of chemical components and external factors underscores the need for a comprehensive understanding of digestive processes. By embracing a holistic approach that considers both the intricacies of gastric physiology and the impact of lifestyle choices, individuals can embark on a journey towards sustaining the delicate balance of their digestive well-being.

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