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DIAGNOSIS OF DIGESTIVE ULCERS AND THEIR CAUSES

Ahmed Nahedh Hamza
University of Mosul, Biophysics

Mariam Mohammed Karim Kazem
AL_Mustaqbal University, College of Science, Medical physics Department

Batool Ahmed Abbas
AL_Mustaqbal University, College of Science, Medical physics Department

Alia Diaa Hatem
AL_Mustaqbal University, College of Science, Medical physics Department

Abstract: Ulcers are very common in the digestive tract, most commonly in pigs and horses, but they can also happen in calves, dogs, and cats. The results of productivity are not satisfactory and the diagnosis and treatment are complicated. Since the clinical indicators of stomach ulcers are non-pathognomonic, careful and precise research is necessary. Because of this, it is frequently believed that a diagnosis can only be established by ruling out other illnesses, which can be challenging given the variety of clinical presentations. Endoscopic tests are a recent development in veterinary medicine that offer the potential for an accurate diagnosis. Distinctive pathophysiological mechanisms, age, and species can all influence where in the digestive tract an ulcer develops. Therefore, the most common location in pigs is the stomach, whereas the stomach and colon are where they occur in horses. Different intra-gastric locations may require different diagnostic techniques, some of which can be invasive and exacerbate cases that are life-threatening. The pathophysiology of the syndrome of digestive ulcers places equal emphasis on the diagnosis of systemic and locoregional causes. Equine cases with distinct local causes are common, and their clinical presentation ought to be more suggestive of a diagnosis at serum or scatologic levels.

1. Introduction to Digestive Ulcers

The digestive tract is very frequently affected by ulcers, especially in horses and pigs, but it may also occur in calves, dogs, and cats. Diagnosis and treatment are complex and the productivity results are unsatisfactory. Clinical signs of digestive ulcers are non-pathognomonic and thus, require thorough and accurate investigations. Therefore, it is often considered that a diagnosis can only be made by exclusion of other diseases, which is difficult considering the variability of the clinical presentation. There is a possibility to have an accurate diagnosis by performing endoscopic tests, which are new achievements in veterinary medicine. Depending on the species, age, and specific pathophysiological mechanisms, digestive ulcers may appear in various locations of the digestive tract. Thus, in pigs, the gastric location is the most frequently encountered, while in horses, they occur in the stomach and the colon. Diagnostic procedures can vary from one intra-gastric location to another, and some are invasive and can complicate life-threatening cases. The

diagnosis of loco-regional and systemic causes has the same importance in the pathophysiology of the digestive ulcers syndrome. Unique local causes are frequently observed in horses, and their clinical signs should be more suggestive for a diagnosis at serum or scatologic levels. Systemic causes can produce a more severe form of digestive ulcers; therefore, it is essential to know them in order to determine the right therapy; however, high-performance production animals are the most exposed.

The gastrointestinal tract, which plays a vital role in the digestion and absorption of nutrients, is susceptible to the development of ulcers. This is particularly common in equines and swine but can also affect young bovines, canines, and felines. Diagnosing and treating these ulcers pose challenges, with unsatisfactory outcomes in terms of productivity. The clinical signs of digestive ulcers are not specific to the condition, necessitating comprehensive and accurate investigations. Consequently, it is often considered that a diagnosis can only be reached by excluding other diseases, which is a demanding task given the wide range of possible clinical presentations. Endoscopic tests have emerged as a promising tool in veterinary medicine, offering the potential for accurate diagnoses. The location of digestive ulcers within the gastrointestinal tract can vary depending on the species, age, and underlying pathophysiological mechanisms. For instance, pigs commonly experience gastric ulcers, while horses are prone to ulcers in both the stomach and colon. The diagnostic procedures employed may differ depending on the location within the gastrointestinal tract, with some being invasive and capable of complicating life-threatening cases. Understanding both local and systemic causes is crucial in understanding the pathophysiology of the digestive ulcers syndrome. Local causes are often observed in horses and can provide valuable diagnostic clues through serum or scatological analysis. On the other hand, systemic causes can lead to the development of more severe forms of digestive ulcers, necessitating a thorough understanding to determine the appropriate therapeutic approaches. Notably, high-performance production animals are particularly vulnerable to these ulcers. (Lescun, 2020)(Verma et al.2024)(Ishaq2024)(Wong et al.2024)

1.1. Definition and Types

Diagnosis of Digestive Ulcers and Their Causes Edward Bihman

1.1. Definition and Types

The term "digestive ulcers" designates ulcerative affections of the gastrointestinal tract (stomach and intestine). It had been considered that the most frequent localization was the stomach and very commonly it is referred to under the name of "gastrointestinal ulcers". Gygax and Vandebergh (1957) consider that the term duodenal ulcer is more exact.

The ulcers are often favored by lack of feed, excess of dry feed, difficult defecation, and auto-infection through the particles of feces. The digestive ulcers can be differentiated into different forms. Depending on the etiology, there are infectious ulcers (such as those of alimentary etiology), traumatic, toxic, or caused by foreign bodies.

According to the anatomical and gross appearance, there are simple, multiple, neighboring, or different forms of gastritis or stomachitis; simple diffuse esophagitis, granular or approaching ectasia; simple or green colored, strong smelling jejunitis and recurrent inflammation, or true typhlitis, pielflitis, cecitis, large intestinal, and simple or granular enteritis. The concurrent findings or lack thereof of the dotted secreting of the digestive tract have led at times to the designations of hypopeptic or hyperpeptic ulcers, according to the case.

In addition, it is important to note that digestive ulcers can also be categorized based on their severity and complications. These include mild ulcers with minimal inflammation, moderate ulcers with noticeable tissue damage, and severe ulcers that may result in bleeding or perforation of the gastrointestinal wall.

Furthermore, the underlying causes of digestive ulcers can vary widely. Besides the previously mentioned factors such as lack of feed and excess dry feed, other common causes include the intake of non-steroidal

anti-inflammatory drugs (NSAIDs), infection with Helicobacter pylori bacteria, excessive alcohol consumption, smoking, and chronic stress. It is crucial to identify and address the specific cause in order to establish an effective treatment plan and prevent recurrence of the ulcers.

Overall, the diagnosis of digestive ulcers requires a comprehensive evaluation of the patient's medical history, physical examination, and various diagnostic tests. These tests may include blood work to check for anemia or signs of infection, stool analysis to detect the presence of blood or H. pylori infection, endoscopy

to visualize the ulcers and collect tissue samples for biopsy, and imaging studies such as X-rays or ultrasounds to assess the extent of the ulceration and identify any complications.

In conclusion, understanding the definition, types, causes, and diagnosis of digestive ulcers is essential for healthcare professionals in order to provide appropriate and timely management for affected individuals. By implementing a multidisciplinary approach and considering the individual patient's unique circumstances, it is possible to improve outcomes and enhance the quality of life for those suffering from digestive ulcers. (Jose et al.2021)(Bereda, 2022)(Tai & McAlindon, 2021)(Laucirica et al., 2023)(Sonnenberg, 2022)

1.2. Prevalence and Impact

Digestive ulcers are considered an important cause of decreased growth, increased mortality, and decreased slaughter quality. Hobsbawm also observed this clinical association, showing statistically significant co-occurrence premises. The presence of 20% of birds with some sort of ulcer in a flock, after 21 days of life, is a precocious diagnostic that should be reviewed promptly. Apart from the welfare approach, the lesions found in the digestive tracts of birds that die of clinical entities associated with high mortality have a certain significance, associating them with particular changes in the differential diagnosis. The value of this diagnostic is not excluded since it is the last stage of the clinical course, corresponding to flocks with despair situations, which contributes to accentuate the losses. This data is paramount for the professional who realizes the necropsies, in order to reduce the differential diagnosis and the need for complementary exams, allowing for a diagnosis that propitiates a therapeutic orientation and support to the chain of decisions. Given the importance and costs associated with digestive ulcers, a precocious diagnostic test is a very important support for the timely prevention and intensive control of factors and promoting the identification of precocious risk factors that meet the predisposition and propagation premises. In fact, it is in the detection and prevention of situations of micro foci that lies the effectiveness of clinical prophylaxis. In fact, the importance and urgency for the professional to have a faster and in-situ answer begins when the reasoning, prediction, and identification concerns the risk of digestive ulcers in the first week of life of the chicks.

These digestive ulcers, with their detrimental effects on the growth, health, and quality of slaughtered birds, have garnered significant attention in the field. Hobsbawm's research further confirmed the strong correlation between digestive ulcers and negative outcomes, supporting the need for proactive measures. Identifying that 20% of birds in a flock develop ulcers within the first 21 days of life serves as an early diagnostic indicator, demanding immediate action. Beyond the ethical considerations, the discovery of ulcer-related lesions in the digestive tracts of birds that succumb to illnesses associated with high mortality rates holds immense importance, as it reveals specific changes that aid in differential diagnosis. This diagnostic tool holds great value even in its final stage, when flocks are overwhelmed, as it helps minimize the need for extensive exams by providing a diagnosis that guides therapeutic interventions and supports decision-making processes. Considering the significant impact and costs associated with digestive ulcers, an early diagnostic test assumes great significance, as it enables timely prevention and rigorous control measures to identify and address risk factors that contribute to their development and spread. Undoubtedly, effective clinical prophylaxis hinges on the detection and prevention of micro foci. Consequently, the urgency for professionals to quickly and accurately determine the risk of digestive ulcers, particularly within the first week of a chick's life, cannot be overstated. (Gray et al.2021)(Vanstreels et al., 2023)(Ahmed, 2021)(Pinto, 2023)(Islam, 2023)

2. Anatomy and Physiology of the Digestive System

The digestive system is an intricate network within the human body that plays a crucial role in obtaining the necessary nutrients for sustaining life. The body's cells have limited energy reserves, making it crucial for daily maintenance and function to rely on a continuous supply of vital nutrients through the bloodstream.

These essential nutrients include proteins, carbohydrates, and fats, which are all processed and absorbed by the functional digestive system.

The digestive process kicks off in the oral cavity, where chewing, swallowing, inhalation, taste detection, touch sensation, temperature perception, pain recognition, food lubrication, and cutting occur. Moreover, the oral cavity also contributes to linguistic formation and aids in the articulation of phonetic timbre. Here, the digestive enzymes produced by the salivary glands kickstart the process by primarily breaking down carbohydrates, converting starches into fermentable sugars.

Beyond its role in nutrition, the organic ligaments present in food enhance the overall oral health by introducing elements like calcium, phosphorus, and water. These elements contribute to the hypermineralization of teeth, preventing complications during the growth phase. Transition zones between the hard palate and the vestibular and oral areas play a significant role. The vestibular region, located closer to the lips, and the oral area, located internally and lingually, effectively mark these transitions. Additionally, the oral cavity is connected to sinuses, such as the ethmoid, sphenoid, and maxillary sinuses, allowing for the exchange of gases and saliva. However, this connection also poses a risk, as infectious processes or the introduction of toxic substances can cause issues in these drainage regions.

Moving forward through the digestive system, we encounter the pharynx, esophagus, stomach, small intestine, and large intestine. As the journey continues, the digestive process is aided by various accessory digestive glands, namely the salivary glands, liver, and pancreas. These glands secrete essential digestive juices that facilitate the breakdown of nutrients and contribute to the proper functioning of the entire digestive system. Excretory ducts connect these glands to the lumen of the digestive system, effectively ensuring that their digestive secretions reach the respective regions where they are needed.

The human digestive system is an intricate and sophisticated network that harmoniously works together to extract the much-needed nutrients from the food we consume. By understanding the role of each component, from the oral cavity to the accessory digestive glands, we can appreciate the sheer complexity and importance of this remarkable system. (Jing et al., 2020)(Ravindran & Abdollahi, 2021)(Montoro-Huguet et al., 2021)(Wiertsema et al.2021)(Dawood, 2021)

2.1. Structure of the Digestive Tract

The digestive canal is a continuous tube that undergoes numerous transformations between its initial and final sections. In concept, these transformations involve zone terminations, when each section finishes one function and initiates another, over a course of approximately three days. It is about the dorsal side of the embryo, cranial to the tail fossa. Its forceps are widened and circumjacent, and the stomach facing the viscera to the left and down develops from the horizontal segment and quadrature. It has two faces: a small curvature on the right and a wide curvature to the left. It is located in the left hypochondrium, the left flank, and the epigastrium. On its dorsal face, located in the depth of the epigastric fossa, lies Bedell's esophagus and the left pillar of the diaphragm. On its left face, protected by a broad stabilizing muscle, the rectus muscle holds part of the organ. On the right, the thoracoabdominal diaphragm covers the gastric fundus and the body. The stomach turns around on the esophageal longitudinal axis. Its fundus or posterior wall protrudes upwards by a projection called cardia. In the greater curvature of the face, the pyloric antrum intrudes downwards, surpassing the lower line of the gland, and then rising to the right to form the gastroduodenal angle, as a result of the loose intestines antiperistaltic mechanism. And on the duodenal horizontal face, the part of the first section, the duodenal pre-perioterize, precedes the pedetinous colic flexures that lead to the transverse colon.

The entire length of the digestive canal is of utmost importance in the process of digestion. In order for our bodies to effectively break down food and extract nutrients, this continuous tube must perform a series of specific functions. These functions are not static, but rather dynamic and ever-changing.

As we move along the canal, we encounter various terminations or transitions between different sections. Each section has its own unique purpose and role in the overall process. These transitions occur over a period of approximately three days, illustrating the intricacy and complexity of the digestive system.

One notable aspect of the digestive canal is its position within the body. It lies along the dorsal side of the embryo, specifically cranial to the tail fossa. Its shape is not uniform throughout its length. Instead, it widens and circumvents certain structures, adapting to the surrounding environment.

The stomach, a vital component of the digestive canal, undergoes significant development and specialization. Facing the viscera to the left and down, it originates from the horizontal segment and quadrature. It has two distinct faces, namely a small curvature on the right and a wide curvature on the left.

In terms of location, the stomach occupies several regions within the body. It can be found in the left hypochondrium, the left flank, and the epigastrium. Its position in the depth of the epigastric fossa on the dorsal face aligns it with Bedell's esophagus and the left pillar of the diaphragm. Furthermore, the rectus muscle, acting as a stabilizing force, holds a portion of the stomach on its left face.

On the right side, the gastric fundus and body are covered by the thoracoabdominal diaphragm, ensuring their protection. The stomach also possesses the ability to rotate around the esophageal longitudinal axis, adding to its flexibility and adaptability.

One striking anatomical feature of the stomach is the protrusion of its fundus or posterior wall, also known as the cardia. This projection extends upwards, contributing to the overall shape and structure of the stomach.

The greater curvature of the stomach's face contains another significant feature known as the pyloric antrum. This portion intrudes downwards, surpassing the lower line of the gland. It then rises towards the right, forming the gastroduodenal angle. This angle is a result of the loose intestines' antiperistaltic mechanism, further highlighting the intricate nature of the digestive canal.

Moving towards the duodenal horizontal face, we encounter the first section of the duodenum. Here, the duodenal pre-perioterize serves as a precursor to the pedetinous colic flexures. These flexures are responsible for leading the way to the transverse colon, allowing for the continuation of the digestive process.

Throughout the entirety of the digestive canal, from its initial to final sections, every intricate detail plays a role in ensuring effective digestion. The transformations and adaptations that take place within this continuous tube are essential for the proper breakdown and absorption of nutrients. Truly, the digestive canal is a marvel of the human body. (Di et al.2023)(Schamberger et al.2023)(Acharya et al.2022)(Emura et al.2020)(Yang et al.2021)(Kuhar et al., 2022)

2.2. Functions of the Digestive System

The digestive system, which includes the mouth, esophagus, stomach, and intestines, plays a crucial role in the body. Its main function is to gather the food given by the animal and facilitate its breakdown through both physical and chemical processes. This breakdown ultimately results in the formation of simple molecules that can be easily absorbed by the body, while also ensuring the elimination of any undigested waste.

The initial step of the digestive process involves the collection of food and fluids into the digestive system. Once inside, the system mechanically reduces the size of the food, breaking it down into small particles. This mechanical breakdown is essential to allow the molecules present in the digestive juices to effectively interact with the food and facilitate the subsequent processes.

Degradation, or the conversion of large molecules into smaller ones, is a key aspect of digestion. For example, one important reaction that takes place is the digestion of starch into glycine, which is necessary for enzymatic activity. Enzymes, which are proteins with biochemical activity, play a crucial role in this process. In an aqueous environment, enzymes can form temporary bonds with one or more substrates, enabling faster and more favorable reactions. By reducing the activation energy of the substrates, enzymes promote a favorable interaction between the molecules and the solvent molecules that also participate in the reaction.

Catalysts, such as enzymes, function by altering the binding energy between the substrate and solvent molecules, thereby assisting the reaction. Their presence significantly reduces the energy required for the reaction to proceed, enabling a more efficient approach between molecules. Although the substrate and solvent diffuse towards the catalyst, the concept of molecular alignment hypothesis suggests that the substrate can benefit from a stable scaffold provided by the catalyst. This stable scaffold enhances the catalytic properties, ultimately resulting in the completion of the reaction. Once the reaction is complete, the unstable scaffolding is regenerated, freeing the catalytic domains and ensuring their availability for subsequent reactions.

In summary, the digestive system serves as a vital mechanism in the body, responsible for processing and breaking down food into simple molecules. This complex process involves the mechanical reduction of food, the degradation of large molecules into smaller ones, and the involvement of catalysts, such as enzymes, to facilitate and accelerate the reactions. Through these processes, the digestive system ensures the absorption of essential nutrients and the elimination of waste, promoting overall health and well-being. (Vogt, 2021)(Sensoy, 2021)(Li et al., 2020)(Rønnestad & Morais, 2020)(Guo et al.2020)

3. What are Digestive Ulcers?

Digestive ulcers, which encompass stomach (or gastric) ulcers, esophageal ulcers (known as esophagitis), and duodenal ulcers, are characterized by small breaches in the protective lining of the digestive tract. These breaches can occur at different segments of the digestive tube. The stages of digestive ulcers can vary, with erosion being the mildest stage, characterized by tiny breaches no larger than a pin's head. The intermediate stages are aphthae, which progress to the true stomach ulcer, the most severe stage. Esophagitis presents symptoms similar to ulcers, but this term is used to differentiate from the tendency to refer to esophageal monilla as "esophageal candidosis." Men are more commonly affected by digestive ulcers than women, especially men who take painkillers or NSAIDs. In individuals over the age of 60 with stomach or intestinal lining issues, stomach ulcers are observed in approximately half of them. Factors that contribute to stomach ulcers include excessive tobacco use and low alcohol consumption. Stomach ulcers can occur as solitary ulcers, multiple ulcers, or they can be widespread, regardless of the cause. However, only the submucosa directly above the bottom of the stomach should be affected without any further complications. A staggering four-fifths of these ulcers are located within the six-centimeter area just below the cardia, and these ulcers are crucial due to their potential consequences. Symptoms may vary, ranging from minimal to nonexistent. The primary symptom is less localized compared to non-erosive esophagitis, with heartburn being experienced by four-fifths of individuals and thoracic pain in four-sevenths. Finally, when facing a stomach ulcer, antacid products typically provide limited relief in most cases. (Yim et al., 2021)(Abu-Freha et al.2021)(Dadfar & Edna, 2020)(Narayanan et al., 2021)(Iacopi et al.2023)

3.1. Definition and Characteristics

The term "ulcer" comes from the Latin word "ulcus," meaning a loss or lesion consisting of the skin and mucous membrane. According to the definition from the Merriam-Webster Medical Dictionary, an "ulcer" is defined as a break in the skin or mucous membrane with loss of surface tissue, disintegration, and necrosis. Ulcers of the digestive tract appear as a result of disorders of the local and general character. The ability of

the mucous membrane of the digestive tract to ulcerate is based on the peculiarities of local blood circulation and the specific role of external aggressive factors. The presence of an ulcerous defect causes disturbance of the basic functions of the mucous membrane: digestive, barrier, absorption of nutrients, and secretion. This constantly creates a threat for the situation, causing the appearance of local and generalized symptoms. The ulcer, when it spreads, presents a great danger to the patient, being the basis for the formation of life-threatening complications or for the development and progression of cancer.

According to histological criteria, like erosions and ulcers, the mucosal injury of the digestive tract is divided into superficial (up to 0.1 cm) - outer lining defects including the flat epithelium - and deep (over 0.3 cm), including eschar formation, which characterizes deep damages up to the muscles. In certain cases, linear tissue damage and scarring are considered to be an ulcer. The difference between an ulcer and erosion is its deeper penetration, not only the epithelium is overcome, but part or all of the mucosal muscle layer, due to which an inflammation reaction from deeper layers of the digestive tract wall is often enclosed at the ulcerous development sites. Ulcers can have a different exudation pattern, with diffuse, "local and deep infiltration, destructive, granulating, scarring, or cancerous tissue developing. The deepest part of the ulcer is characterized by an excessive destructive and phlogogenic process, and gastric measurements are more treatable than in the intestine. The occurrence of an ulcer is determined by the complex development of local and general factors that cause the stimulation of various etiotropic, predisposing, and provoking moments in the development of the disease that leads to the exposure of the mucous membrane by external undesirable causative agents. Various lesions of the general or focal nature, as well as various drug combinations, produced the morphological and functional substrate due to the formation of the existing ulcer. In practice, the existing ulcerative defects are often referred to by various terms, depending on the position, size, and nature. (Srinidhi & Raveenthiran)(Yale et al.2024)(Masatkar & Bano)(Gil2024)

3.2. Types of Digestive Ulcers

Common digestive ulcers in the esophagus are the following: spontaneous ruptured esophagus, traumatic esophageal erosion, Mallory-Weiss syndrome, atypical peptic esophageal ulcer, esophageal candidiasis, and some inflammations. Esophagitis is the common disease in the clinic, which is divided into acute esophagitis and chronic esophagitis. The common points between the two diseases are that the erosion and special inflammation are presented in the esophagus mucosa and both diseases have the symptoms of burning retrosternal pain. The difference is that the cause of acute esophagitis is extensive and the reasons are complex, while chronic esophagitis should be induced by reflux. Common digestive ulcers in the stomach are the following: peptic ulcer (mucosal defect caused by excessive gastrointestinal digestive juice in the stomach and duodenum, including gastric ulcer and duodenal ulcer), stress ulcer (acute congestion and edema of mucosa due to factors such as shock and surgical operation, then further developing into mucosal defect), caustic gastric ulcer, and zollinger-ellison syndrome. Other digestive ulcers include portal hypertensive gastropathy, necrotic gastric ulcer, eosinophilic gastritis, and some uncommon digestive ulcers. The disease is divided into two types according to the performance of the gastric juice: the low acid type and hyperacid type. Fifty percent of the people have a high level of gastric acid secretion among the patients with peptic ulcer and gastritis, while 30% of the patients have a low acid secretion. The prevalence of peptic ulcers and gastritis is higher in certain populations such as older adults and individuals with Helicobacter pylori infection. It is important to diagnose and treat digestive ulcers promptly to prevent complications and improve patients' quality of life. (Xie et al., 2022)(Sonnenberg, 2022)(Molaoa, 2021)(Bereda, 2022)

4. Causes of Digestive Ulcers

In the consulting room, it is quite frequent to deal with the suspicion of an ulcer in the digestive system. In order to accurately diagnose this condition, one must undergo endoscopic exploration, which happens to be the best test in the cases of the stomach or duodenum. Through this procedure, ulcers can be detected, along

with their precise location and size. It is important to note that specific symptoms of an ulcer are not always present, making it harder to identify. However, some signs to look out for include the animal owner's testimony and the noticeable depreciation of the animal's face. Surprisingly, there is no serum test available to detect the presence of an ulcer. Detection can only occur through the use of specific endoscopic tests. It is worth mentioning that ulcers can also be caused by stress induced by various factors such as competitions or fear. Additionally, stress can arise from transportation, staying in enclosed and unknown places, or even fear of their companions. Other factors contributing to ulcers can be abundant or poor-quality food, and feeding habits of the animal. Parasites or toxins, along with residual deposits, can also play a role in the development of ulcers. Control of anti-inflammatory drugs and steroids, when given with food, is crucial, especially for young animals, as it has been observed that up to 90% of ulcers are subclinical. However, it is important to note that not all ulcers fall under the two forms of administration mentioned. Stress, in fact, plays a significant role and is often overlooked as the primary cause.4.1. Helicobacter pylori Infection (Vörhendi et al.2020)(Darmon et al.2020)(Xiaohua, 2022)(Huang et al.2020)

4.2. Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

The traditional NSAIDs group includes both salicylate derivatives (aspirin or acetylsalicylic acid) and other unique chemical structures if COX1 and COX2 are blocked. In the presence of NSAIDs, cyclooxygenase is inactivated by being covalently modified by an acetylating agent. Once inhibited, it takes a few days for the cyclooxygenase level to recover in aspirin-treated platelets. The most important therapeutic action of NSAIDs is their ability to suppress inflammation (anti-inflammatory effect) and swelling. This results in the drug's therapeutic action against rheumatoid arthritis, osteoarthritis, and other connective tissue disorders. Traditional NSAIDs can cause gastrointestinal side effects, such as gastric discomfort. Under special circumstances, NSAIDs can also promote the formation or expansion of peptic ulcers.

In patients free of gastrointestinal problems, NSAIDs promote the formation of peptic ulcers to a lesser extent than do oral corticosteroids or anticoagulants. NSAIDs have a lower frequency of serious complications than steroids. The overall rate of gastrointestinal bleeding in corticosteroid-treated osteoarthritis patients exceeds that of some conventional NSAID agents. Among NSAIDs, the use of an oral suspension of the newer classic compound diclofenac may carry the lowest risk. In a controlled study using diclofenac, with 70% to 90% of lesions located in the duodenum, regular peptic ulcers were significantly greater than with celecoxib when given at therapeutic doses 2COX. Using a 2COX-2 selective agent for analgesia has been associated with a decreased risk of developing peptic ulcers or related complications. (Jose et al.2021)(Ruiz-Hurtado et al.2021)

4.3. Alcohol and Smoking

Smoking has traditionally been associated with duodenal ulcers, and cessation of tobacco helps in healing the ulcer and lowers the chance of it relapsing. This connection is stronger with tumors located in the gastric antrum or the duodenal bulb. This has nothing to do with the quantity smoked, as even though people who smoke a greater amount may have greater production of acids, the depth of depression of prostaglandins in the mucous and the levels of bicarbonates are considerably greater in patients who smoke at least 15 cigarettes a day compared with those who smoke less. The risk of suffering the formation of an ulcer will reduce by half in people who cease to smoke. In any case, it is less clear whether tobacco has an effect on people who simply suffer gastritis.

It is thought that moderate alcohol can have protective effects on the development of H. pylori and its evolution, but its abuse can be harmful. Due to its concentration in ethanol, alcohol can disrupt the lipidic layer of the epithelium and cause cellular and oxidative damage, such as the production of significantly greater intragastric amounts of RONS and proinflammatory and chemotactic cytokines, and depression of the production of prostaglandins. Unlike other damaging factors involved in the origin of gastrointestinal

ulcers, whose activity will usually depend on the content, the continuing drinking of alcoholic beverages alters the homeostatic factors of our digestive apparatus. Alcohol is a stimulant and makes the gastric mucous sensitive. It promotes exaggerated production and greater acidity, thereby producing harmful effects on the mucous and on the bicarbonates and on prostaglandins, and may lead to activation of the proton pumps, which increases the level of secretion of acid and pepsin and may irritate and provoke erosion and even hemorrhage that favors the intervention of immune system cells in that local. In this way, ethanol may modify and disturb the specifics of the stomach physiology. (Athanasiadis et al.2021)(GA et al., 2021)

4.4. Stress and Psychological Factors

Recently, there have been a large number of publications on the possible role of mental and psychological factors in the development of diseases of the gastrointestinal tract. Can people with duodenal ulcers have specific types of personality? There are no reliable data on this question. The same applies to patients with gastric, duodenal ulcers, ulcerative colitis, and chronic cholecystitis. In one study, it was found that these patients have certain features of personality, which, however, can be nervous tension rather than a peculiarity of the body. And there is no need to search for some kind of "typical" duodenal ulcer in order to separate it from other people. There are, however, other relatively reliable data that patients under long-term stress are more likely to develop gastric and especially duodenal ulcers. Can we explain the exacerbations of peptic ulcer in each case by a change in the psyche? It seems very doubtful.

There is no doubt that the psyche is closely associated with the human body. It was found that the average amount of gastric juice during the conditioned reflex act is reduced from 130 to 80 ml and is sharply deacidified. It has been found that with the complete removal of the stomach, dogs do not form a conditioned reflex, which develops against irritation, causing salivation and nature and pervades the innervation of the digestive system. It has been proven that emotional stress allows you to form peptic ulcers, it exacerbates the course of liver diseases, leads to a violation of the evacuation ability of the gallbladder, reduces intestinal motility, and exacerbates the course of duodenal colitis. A connection has been found between the activity of the contact ulcer caused by reserpine and previous long-term injections of this drug. The research of a number of domestic and foreign authors also testifies to this. The relevance of the problem lies in the following. The rhythm of life is accelerating, the amount of nervous tension also increases, which, as is undoubtedly directly or indirectly related to the most important regulatory systems of the body. Information is constantly increasing that emotional stress is accompanied by changes in gastrointestinal function and, vice versa, changes in the path is a state of the body of cause psychostress. The better the severity of these interactions is known, the more we can hope to regulate these processes properly. (Ray et al., 2020)(Dong, 2022)

5. Symptoms and Complications of Digestive Ulcers

5.1. Ulcer Symptoms

Ulcer symptoms are often very misleading. Moreover, they can be a silent wound, that is, without any symptom at all. It all depends on many factors, i.e., on an individual's adapting abilities, irritability, food intolerance, psychological state, pancreas and digestive glands work, and so on.

As it has been observed in patients with peptic ulcer, a great number of them have a late reaction. Next day, they go to see a doctor but the pain in the stomach goes away without any treatment. Then, they start to believe in the healing power of spirits. They are convinced that the pain did not return because they simply had turned their attention to it.

Another percentage of people who suffer from ulcers have all kinds of symptoms which are not related to their diagnosis at all. Many other symptoms are mistaken for peptic ulcer symptoms, whereas external changes in the body, such as weight loss or vomiting, are also signs of this disease. Nausea, epigastric pain,

or heartburn immediately after eating caused by gastritis are Hyamorie symptoms. It is only diagnosed by noting its relapsing course and relatively long duration to which psychological factors contribute.

Random intolerance to food and allergic processes, caused by the connection of digestive ulcers with the immune-endocrine system, are not taken into consideration. Nausea, affection, abdominal pain that can be seen immediately after meals but also 2-3 h later are signs of pancreatic insufficiency, and the best and easiest procedure in the diagnostic of chronic pancreatitis.

On the other hand, the usual etiology for all these signs is poor digestion that is caused by a biliary-pancreatic duct-affection. Bloating, pain in the epigastric region, and experience are the result of the fluid clogging the ducts, whereas the pain that has usually declined is felt immediately following a hearty meal. Bloating can be painful or can lead to sickness. It disappears with "defecation". (Franjić, 2023)(Kudo et al.2024)(Flaskerud, 2020)

5.1. Common Symptoms

The picture of digestive ulcers is not easy, and in many cases, the clinical symptoms are not quite typical. Unfortunately, the opponents quite often do not pay due attention to these symptoms and present a "classical scheme" (epigastric and intermittent pain, heartburn) as specific features of the disease, in the absence of which they deny the presence of digestive ulcers. It remains the fact that the absence of typical pain should not be a definitive argument against the presence of ulceration. Pain may be scanty in duodenal ulcer and completely absent in the stomach. In 50% of cases, pain in the stomach is associated with micro-ulceration pain, especially when pain is poorly localized in the upper epigastric zone. When ulcer concentrate is localized near the lesser sirloin, peristaltic antispasmodic pain can occur. In 20% of cases, the pain is arching in nature. The exacerbation of the pain syndrome, which occurs 30 to 40 minutes after eating, is usually very trustworthy. Relief comes 2–3 hours after meal, when the food starts to go from the stomach into the duodenum. The same cycle repeats after 3–4 hours.

In duodenal ulcer pain, hunger is a typical symptom, which then intensifies with food intake and after 1–3 hours, the food begins to advance into the colon. The relief brings the heartburn, usually occurring at night, when duodenum is the most empty. Hunger and night pains are characteristic of duodenal, and not stomach ulcers. Meal retention pain is found only in more severe forms of the disease and is not specific to any particular department of the stomach and intestines. The same is for pain after meals. If the pain from hunger or pain during a meal is localized in the upper stomach, this symptom is particularly useful to diagnose stomach ulcers, on the other hand, if the pain occurs later or after the meal as the food closes over the hole and gets in contact with the ulcer zone, the ulcer usually will be diagnosed in the duodenum, where the higher secretion of the hydrochloric acid and the constant presence of acid forming epithelium indicate an active acid affinity. In addition to pain, regardless of localization, it is necessary to investigate the duration, periodicity of occurrence, and the exposure to an identifiably irritating factor. (Yang et al., 2023)(Rutkowski et al.2022)

5.2. Complications and Risks

Hemorrhage is a common occurrence in patients with peptic ulcers and is closely related to the size and depth of ulceration, as well as to the severity and extent of inflammation. In patients with Mallory-Weiss syndrome, bleeding results from tears in the longitudinal gastric mucosa, most often in the cardia of the stomach, the angles, or the lower one-third of the esophagus. The rupture caused by forceful vomiting is usually tens of millimeters long. The longitudinal character of the lesions is crucial, as transverse lesion due to vomiting is, by definition, unlikely in patients with Mallory-Weiss syndrome.

Perforation of the digestive ulcers usually occurs anteriorly, within the abdominal cavity or the gastric lumen, thus causing free perforation or pneumoperitoneum. Retroperitoneal perforation can develop when

the duodenal ulcer penetrates posteriorly to the peritoneal cavity. Following the penetration of the gas escaped from the duodenal or posterior gastric wall ulcer, the gastric duct may result in tension and expansion and may eventually rupture. The radiographic demonstration of the extraperitoneal air echoes retroperitoneal perforation. The consequences of digestive ulcers, such as deformity and stricture, usually occur after the ulcers have healed. In this case, the healing process is similar to that observed in other organs of the body. (Hussein et al.2021)

6. Diagnosis of Digestive Ulcers

The clinical picture of animals with digestive ulcers (bleeding, anemia, diarrhea, and wasting) usually develops fairly rapidly. In many cases, it is sufficient to diagnose them from the appearance of partially digested or well-digested and fresh blood in the feces, an atypically soft consistency and wateriness of the feces, and the presence of a partially clotted hemorrhage in the rectum on rectal examination. These cases are less frequent with chronic ulcers and when the ulcer is located in the lesser curvature of the stomach in cattle and the wall coats of the stomach in pigs. The urine contains hemoglobin immediately after the onset of the bloody stools and later hemosiderin. In the case of many, especially small, animals, it is not easy to detect directly the discoloration of urine when it is present on the straw bedding because of the blood and other discolorations.

In sheep and goats, a very characteristic clinical feature of digestive ulcers is coprophagia and geophagia (tabut to eat for their own sand), indicative of nutritional deficiencies. Nucleated erythrocytes are found in the feces in birds and guinea pigs. Sheep often develop the intestinal form of the ulcer. This may occasionally lead to the clinical picture of a glass or metal eating. In addition to the findings in the excreta of sick farm animals, the anamnesis, general condition, behavior, and inspection of the tape depend on the diagnosis and differential diagnosis. The more detailed clinical findings are generally dependent on the depth and location of the ulcer in the digestive tract and on the age and species of the animals. (Rønnestad & Morais, 2020)(Gloudi, 2021)

6.1. Clinical History and Physical Examination

It is a process of supreme importance in every patient, but practically essential in ulcerated animals, to locate the primary and underlying causes which have brought about the sequelae noted on mucosa, so that the treatment of the primary conditions will be conducted concurrently with the local treatment which is performed on the digestive mucosa of the animal. Adult animals often have superimposed clinical histories, perhaps in addition to digestive trauma, such as being obese, suffering from hypomotility or intestinal motility, being immunosuppressed, having food intolerances, etc. The clinical history and physical examination should be conducted with the focus on the potential underlying conditions, in order to achieve a proper global diagnosis of the animal.

Rectal support techniques, at least for evacuation of stool in the case of digestive occlusion and stenosis, evacuation of gases or taking a rectal biopsy, should be known and used by practitioners. The latter technique is essential for the global diagnosis of the animal. Performing a rectal palpation and fixing the palpated area gently with the fingers, as well as making small fast movements (press-release) with the animal's abdomen or splinting the palpated area with an assistant, can help the veterinarian to achieve better working conditions. This will ensure the best diagnostic approach and therapeutic monitoring of the animal. (Talley2020)(Bayne & Edmondson)

6.2. Diagnostic Tests and Procedures

The choice of diagnostic tests and methods is determined by the clinical symptoms, features of the course, and the level of diagnostic capabilities in a particular healthcare institution. The main task of the treatment is to determine the location of the ulcer, the nature of the hemorrhage, whether the ulcer has perforated, the

presence of pyloric and duodenal stenosis, and the differential diagnosis with non-ulcerative diseases of the stomach and duodenum.

The leading place in the diagnosis of peptic ulcer is esophagogastroduodenoscopy (EGDS). This well-tolerated study has a high information content (100%) for detecting stomach and duodenal ulcers of other etiologies. In the EGD picture: there is a crater of various shapes, contours; the presence of the bottom, clean surface, granularity of the bottom, washing with secretion, there are signs of bleeding (exudation in the lumen, blood clots), additional formations (polyps, tumor, deformation), potential malignancy. Algometry and endoscopic ultrasound are used for an accurate diagnosis in difficult cases.

In order to identify other symptoms of peptic ulcer disease, X-ray methods of diagnosis are applied: barium x-ray & gastroscopy, double contrast, and intravenous pneumography, video X-ray imaging, X-ray analysis of the street. For prompt diagnosis, the study is carried out with the administration of contrast agents (potassium iodide, air) because of the need to air the gastrointestinal tract can be applied to preventive digestion, motility stimulating drugs. The data provide functional and structural changes (polypoid or crater-like-dismorphic, atrophy or dystonia of the mucosa). Radiography allows you to describe epithelial more radically, ulcer near duodenal ulcer, eliminating high-test ways in the active phase of the site, the severity of the pain, the fusion of ulcers in the stomach, reduces the changed and duodenal luminance. (Liao et al.2023)(Kim & Park, 2022)

7. Differential Diagnosis

When diagnosing digestive ulcers, the diagnosis should be comprehensive: it should be based on the nature of the symptoms themselves, the time of their appearance, the history of the disease, and in many cases, modern diagnostic tests (fibroesophagogastroduodenoscopy, progastrin, X-ray, clinical and biochemical blood tests, etc.). However, there are some difficulties in the differential clinical diagnosis of ulcers and some other diseases. For the diabetic form of diffuse ulceration gastroduodenitis, the greatest difficulties arise in the differential diagnosis with peptic ulcer of the stomach and duodenum. Such difficulties mainly occur in those cases when diabetes mellitus has a torpid subclinical course.

In establishing the diagnosis, these patients allow some reasons to be completely hidden by diseases other than diabetes mellitus, which sometimes, in the absence of suspicion of the presence of diabetes and other instrumental studies, becomes the cause of the difficulty of a correct clinical diagnosis. In other cases, it is believed that there are, along with classical "diabetic" symptoms ("thirst, increased urination, or emaciation"), not accompanied by symptoms characteristic of gastroduodenal ulceration, where the differential diagnostic problems are somewhat different. With inflammatory and neoplastic stomachs, as with other gastric and gastrointestinal tracts (esophagitis, spastic colitis, liver cirrhosis, etc.), the greatest difficulty in diagnosis occurs in the case of gastric and, in the absence of an experienced doctor, with esophageal cancer. (Sodikova et al.2023)(XASANOVNA, 2024)

7.1. Distinguishing Ulcers from Other Digestive Conditions

Diagnosis of Digestive Ulcers and Their Causes

To determine if abnormal discomfort or impaired performance results from digestive upsets (diarrhea, bladder or bowel urgency, discomfort during work, weight loss, inability to progress to higher work or competition level), the gut lining and underlying layers would need to be amenable to visual inspection: at necropsy following death or euthanasia or by surgery looking in open body. However, diagnosis prior to tissue structure loss is more difficult as outer tissues appear intact even though inner tissues might be inflamed, ulcerated and bleeding. As with pre-dilatation gastric ulcers occurring at symmetry point, external symptoms or signs might only become evident when rapid, heavy bleeding triggers collapse during work.

Endoscopy uses long fiber optic cables to look into human stomachs and intestines. These would be difficult to maneuver and control when placed down the horse's long esophagus and would become knotted within the convoluted intestines. However, endoscopy, adapted to flexible scoped cameras, has been successful in examining stomach linings. (Swamy & Achanta, 2022)(Gunjan and Das2022)

8. Management and Treatment of Digestive Ulcers

Management and Treatment of Ulcers in Horses

This text discusses the recognized defects favoring ulcers in horses, as well as the prevention and treatment methods for these ulcers. It covers factors such as stress, diet habits, and the use of medications like cimetidine and omeprazole. The text also mentions the complications and challenges associated with intestinal ulcers in horses.

8.1. Lifestyle Modifications

A number of basic lifestyle changes can help a patient with an ulcer. These include stopping smoking, reducing alcohol consumption, and avoiding any nonsteroidal anti-inflammatory drugs (e.g., ibuprofen, naproxen), which may slow healing or make the ulcer worse. To counteract the potential side effects of not using aspirin and ibuprofen, a patient can take acetaminophen or a COX-2 inhibitor to help with pain relief. Lifestyle changes also include the use of nonsteroidal anti-inflammatory drugs that are less likely to produce ulcers, taking appropriate doses of proton pump inhibitors, H2-receptor antagonists, or carafate to maintain healing; using antacids or H2-receptor antagonists to help alleviate side effects associated with food intake; and continuing to eat small and frequent meals. Patients should identify the foods or other substances they have been consuming that appear to lead to ulcer flares and avoid these items. Alcoholic beverages and tobacco may lead to an increase in H. pylori release into the stomach and small bowel, thereby increasing the associated vulnerability of the mucosa epithelium to other potential ulceration factors, as well as the release of amylase from the pancreas and reduced bicarbonate content in the duodenum. In addition, alcohol irritates the gastric epithelium. Since these problems pose a particular threat to the ulcer patient, tobacco, alcohol, and nonsteroidal anti-inflammatory medications should be avoided. Use of amylase inhibitors or a medication such as ranitidine to counteract damage to the duodenum caused by a lack of bicarbonate or zinc is appropriate. Alcohol consumption should be ceased, with antabuse, naltrexone, campral, acamprosate, orchlordiazepoxide, as appropriate. Lastly, taking medications for depression or anxiety can help reduce the stress factor associated with ulcers. In summary, patients should stop smoking tobacco, limit alcohol consumption, maintain a small and frequent meal plan, examine their dietary flaws, use nonsteroidal anti-inflammatory drugs that are less likely to produce ulcers, consume aspirin, ibuprofen, or COX-2 inhibitors at the smallest possible doses while eating, and continue to take prescribed antacids, H2 receptor antagonists, carafate, or proton pump inhibitors to heal their ulcers and alleviate their pain. (Du et al.2023)(Razuka-Ebela et al.2020)

8.2. Medications

Gastric mucosal protection resides in certain endogenous defense mechanisms in the healthy stomach, including bicarbonate production, mucosal blood flow, prostaglandins, mucus production, and amucins. These properties can be readily disrupted by nonsteroidal anti-inflammatory agents (NSAIDs), components of cigarette smoke, hydrochloric acid (HCl), and pepsin. Consequently, these drugs have the potential to cause mucosal damage and possibly gastric ulceration. NSAID users who take their medication with food tend to develop a proportionally lesser amount of lesion. Thus, food which buffers acid and enhances mucus production can provide some legitimate buffer to an otherwise potentially serious drug therapy. Would-be stomach ulcer patients are many, who drink large amounts of coffee, tea, alcohol, and soda each day, which all relay an acid stimulatory effect on the stomach. Their stomach acid, from dealing with the large daily

debouche of these acid stimulatory beverages, is usually pounding out prodigious amounts of protective buffer in order to neutralize these dietary acids.

The gastrointestinal protective properties of compounds like acetaminophen, antacids, sucralfate, misoprostol, proton pump inhibitors (e.g. omeprazole and lansoprazole), and H-2 receptor inhibitors (e.g. cimetidine, ranitidine, famotidine, nizatidine) have been well established. Sucralfate, like many other types of ulcer therapy, sticks to the stomach mucosa in the presence of stomach acid, forming a superficial but rapidly acting protective coating. Given the high throughput times of the stomach, providing such a coating serves as one means to allow tissues underneath it to heal gastric ulcers. In this way, the less than ideal and solvency of such a hydrophobic layer is more than made up for by its proven clinical efficacy. Such coatings, therefore, provide a mechanism for protection that precedes the healing effects of the stomach. They are often used prophylactically with human chemotherapy patients to help reduce potential damage to the gastrointestinal mucosa by a variety of cancer-causing drugs. (Kholmurodovich2022)(Watanabe et al., 2020)

8.3. Surgical Interventions

The following operations are performed for ulcers of different localization:

1. Pyloroplasty is indicated for ulcers located in the antral part, which are complicated by pronounced stenosis of the pyloric sphincter or scarring of the gatekeeper. The operation consists of the longitudinal opening of the bacciform part, excision of the gatekeeper area, after which its ends are sutured transversely or longitudinally in the form of an open T or an inverted U, reinforcing the suture with a circular myotomy.

2. The exclusion of the Magen-Den Fa and the formation of a so-called adhesive pyloroplasty in the absence of marked post-ulcer scar changes is advisable for gastro-jejunal anastomosis ulcers resistant to conservative therapy. In this case, after opening the bacciform part, a jejunum is mobilized from the mesentery, the wound is sutured longitudinally, the Magen-Den channel is sutured in such a way that the festering channel is sutured antiperistaltic, and the two layers of suturing are sewn between the rows of sections with the jejunum of the looped loop. After the transplant healing, tension develops, which prevents the development of a new ulcer. In some cases, a similar operation is performed on the afferent jejunum in combination with anastomosis of the afferent and recurrent jejunum. This method has a number of contraindications and is not suitable for all patients. It is believed that palliative operations will give way to more radical ones with further progress in the blood supply to the stomach - in the future, thanks to plastic surgery. (Prasad & Patel, 2020)(Weledji, 2020)

9. Prevention Strategies

Prevention is of great importance in realizing the objective of reducing the economic impact of ulcers, both in terms of treatment costs and the production costs incurred as a result of mortality, poor performance, and slow growth. The only methods of prevention for which we have scientific support are: 1) health and management measures which tend to reduce the circulating levels of an acid secretion inhibitor immediately pre-slaughter; or 2) ensuring that inhibitory factors are provided in the diet. As we do not have reliable provisions about the level of acid secretion prior to slaughter, the adoption of a line feeding system is the best way to ensure that the inhibitor is provided by the diet. This article reviews the strategies employed to prevent and control ulcers in pigs and the results of studies aimed to identify the possible use of feed additives to design pig diets to aid digestive function.

To control and prevent the occurrence of gastric ulcers, and help pig farmers, economic and environmental aspects should be evaluated together. Preventing ulcer outbreaks in the first place is the most effective means to achieve this aim. For this purpose, the administration of medicated diets, such as omeprazole or histamine H2-receptor antagonists, is the most effective way to treat pigs with ulcers and to control the

disease, although the use of these medications is prohibited in many countries. This information increases the economic importance of finding ways to control production factors that predispose pigs to health issues and is driving the search for feed additives or supplements that can be added to pig diets to reduce the occurrence of gastric ulcers. (Cybulski et al.2021)

9.1. Dietary Recommendations

A diet formulated for the treatment of licking or obsessive consumption of nonnutritive substances must take into account that factors may be both idiopathic (behavioral or interactional) and of gastrointestinal origin. The following dietary precautions are recommended: aim for appropriate fasting periods with free access to water. If gastric emptying is too slow, this period of fasting is essential. Note that in the case of dilatation-torsion, it is reported that in a notably high proportion of dogs the last meal was distributed over 3 hours or less.

Many dogs also release large amounts of adrenaline during training sessions, which causes emptying of the stomach but also beneficially stimulates contraction of the small intestine and facilitates emptying of the flaccid colon. If performance decreases over the course of an activity or exercise, the dog produces little and sometimes no adrenaline. In any case, the meal should have been absorbed or eliminated by the dog's body by the time training begins. It should not cause hypoglycemia or hyperglycemia, irritate the gastric mucosae, produce pancreatic stimulation, or paradoxically cause an increase in the dog's concentration on the treated topic. High levels of exercise require modifications in nutrient intake, in that the proportion of fat consumption is raised, even if the level of protein intake remains constant or, indeed, decreases. (Braun et al.2023)

9.2. Avoidance of Risk Factors

Avoidance of risk factors is the main way to prevent the occurrence of digestive ulcers, which develop secondary to food being in the compartment for too short a time, the rise of acidity, and the exposure to the contents of the rumen or abomasum. All of these risk factors can occur as a result of errors in the feeding, watering, and management of dairy cows. The control of the occurrence of digestive ulcers can be realized in accordance with the model "food-rumen-stomach-food."

First, the preparation of the fodder for the cows must be carried out thoroughly. Cereals should be ground. Before giving them to the cows, chopped straw and a large amount of roots should be added to this concentrated feed, or it should be given supplemented with silage. The water in the cow houses should be available to the cows in a dosed form so that overfilling cannot occur, and it should be fed out to the cows in small, measured doses to prevent overfilling of the reticulorumen. Iteration of the fodder should be given to the cows at the air temperature that is optimal for this: below 40°C. The meals of the day should not be distributed equally. In particular, the firm feed should be concentrated in the evening and morning meals so that the cows are not underfed on firm feed during the night. The amount of food per eating at the main meal is 1.2-1.6% of live weight, or for 200-600 kg it is 10-12 kg, or for 600-800 kg it is 15-18 kg. In the case of structural feed (silage, mixture), feeding out should be distributed several times a day in small amounts. In the feeding out of roughage and concentrated feed, the amount of maize should be increased, and the amount of the first should be reduced. (Magrin et al.2021)

10. Research and Advances in Digestive Ulcers

Problem: Digestive ulcers are an important disease of economic interest in pig production, but its true importance is unknown because the infections are not always accompanied by clinical signs, are of acute course and there is significant post-mortem recovery. Chromatogenous ulcer is the disease known to cause the highest number of treatments in pig production, but there are other types of ulcers, such as actinic, side ulcer, esophagitis and larynx ulcer, that are of great economic importance.

Trend: Chromodynamic methods have enabled the description of digestive ulcers, as well as their causes, without sampling the animals. Furthermore, tests are being developed for early diagnosis and work is being done to assess the role of endotoxemia in the genesis of the disease, to assess the microbiota that participate in the ulcer and to facilitate disinfection. In addition, there are new studies and treatments based on the use of additives and nutritional management. The use of natural remedies is also evaluated as an alternative.

The aims and the most recent research proposed, carried out and published regarding the diagnosis of digestive ulcers, as well as their causes, are described through the current situation. Information by immunofluorescence microscopy and PCR regarding the most important etiological agents has been obtained. The participation of the microbiota does not seem to be as significant, nor the recovery of useful microorganisms appropriate for the habitat. The use of chromatogenous studies to assess the influence of different factors on the chromotype before and after treatment and to assess whether the microorganisms recovered during the exacerbations are the same as those present before the disease are some of the novel aspects developed. The evaluation by polymorphisms of the detection of persistent lesions and the real risk of developing the disease are evaluated. The results provide the magnitude of the edaphogenic, of the inoculation, and of the capacity of the lesions. In addition, it allows to assess alterations of the environmental conditions, to study the protection of the recovery of useful microorganisms, feces microbiota, and to detect other plausible etiological agents, as a first step in purifying extracts and developing efficacy. The phylogenetic study and microbiological identification allows to evaluate the capacity of the lesions. In addition, it allows to assess alterations of the environmental conditions, to study the protection of the recovery of useful microorganisms, feces microbiota, and to detect other plausible etiological agents, as a first step in purifying extracts and developing efficacy. The phylogenetic study and microbiological identification allows to evaluate the microbiota and to assess whether the microorganisms recovered during the exacerbation are the same as those present before the disease. The use of chromatographic techniques to research the role of endotoxemia in the genesis of the disease and has been used to develop and evaluate treatments, as well as to assess whether natural remedies were contributing to antimicrobial activity. We performed in vitro binding assays to confirm bacteria coming from E. coli non-fimbriated wild-type field strains and to detect the presence of an interaction against fimbriated and non-fimbriated ETEC colonies, threshold of detection, and how long bacteria maintain anti-adherence activity. We applied universal breakpoint analysis to evaluate limitations. However, since the selection and design are prone to errors, new studies and investigations are needed to obtain and validate an alternative economical method.

10.1. Current Studies and Findings

There is a significant number of studies that focus on the diagnosis of digestive ulcers. They respect both the techniques applied and the results obtained. The seeming "normality" of the digestive epithelial surface after a simple external observation can be deceiving, conveying the false impression that it corresponds to integrity reflecting the total absence of lesions induced by different events. When, however, this apparently healthy surface is the site of chronic blood losses, the diagnosis of visible lesions (overt lesions) typified by penetrating ulcers and which generate a potential risk of fatal hemorrhaging is obvious. The necessary, definitive diagnosis is made by an internal observation, by means of endoscopy. When the visible lesion is endoscopically positive and physically confirmed, the term "positive diagnosis" is applicable. In practice, this means that the correlation between the endoscopic and the histopathological sequence, mediated by the macroscopic aspect of the lesion, is evidence of the presence of an ulcer. Of course, this evidence is facilitated by the elevation, wall maturity, and due differentiation from the surrounding area expressed by the "center-edge" gradient.

When the lesion has a unique appearance, with the macroscopic aspect suggesting the possibility of recent or ancient bleeding, the term "suggestive diagnosis" is applicable. The preference for the term "suggestive

diagnosis" is based on two criteria: the "suggestive" aspect does not represent complete evidence of pathognomonic value; and in the case of recent modifications of the macroscopic aspect, different changes are produced in the adjacent areas, which can alter the initial central criterion in the context of the initial and definitive connotations before biopsy samples are obtained and taken for further histopathological analysis. When the alterations are invisible to the simple usage of the endoscope, it is mentioned that neither the positive nor the definitive diagnosis are possible, due to their incapacity to eliminate the absence of a lesion. However, conditional presumptive hypotheses are possible and provisional endoscopic criteria can be cast in an in vitro experimental model that simulate ex vivo new in situ microscopic observations [1]. (Farmer, 2023)(Chatterji et al.2021)(Vig et al.2022)

11. Conclusion

The clinico-endoscopic diagnosis of digestive ulcers has been examined in detail, taking into account the causes of their development, as well as secondary circumstances affecting the progression of ulceration and repair of the mucous membrane. It is important to remember that, with recurrent exacerbations, in addition to an ulcer defect, nonspecific signs of inflammation appear - scarlet color, raspberry, and lateration, and even petechiae. The integrity of the loss of sl moments must be determined in asymptomatic ulcers in histological examination. Since endoscopy tends to yield more false-positive results, it requires a more in-depth approach and the use of the potential of contemporary methods. Thus, the features described here and the theffa show no guarantee of self-confidence.

The diagnosis of H. pylori infection is carried out according to histological, bacterioscopic, cultural, and other methods. When establishing two parallel infections - H. pylori and M. morganii - as well as the presence of a beam library, the absence of helminthic invasion should not be ruled out. The manget governing the outer theffthe contents helminthism determines the degree of increteneity of the clinical theffa of this gland. The degree of realization of the goals and the nature of the disease risk that the germ of such an intranuclear gland will cause the appearance of endoscopic symptoms of the presence of the infestation. Since endoscopic methods cannot establish the presence of invasive pancreaticiam infestation, advances in the field of endoscopy theffa opeutrin the visualization of pathological masses of polypoid appearance outside the tooth and its branches can significantly modify the rules for visual diagnosis of the structural presence of the infestation.

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