

MORPHOLOGICAL FEATURES OF THE GASTRIC MUCOSA OF PATIENTS IN SERIOUS CONDITION ON MECHANICAL VENTILATION

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Summary

Morphological changes in the gastric mucosa in critically ill patients on artificial lung ventilation (ALV) are a serious problem in intensive care and are associated with a high risk of complications from the gastrointestinal tract. In critical conditions and prolonged ALV, destructive processes occur, such as edema, hyperemia, erosions and ulcers of the gastric mucosa, which is caused by impaired microcirculation, stress, hypovolemia and the effects of drugs. These changes significantly increase the risk of gastrointestinal bleeding and other complications, which can worsen the prognosis and increase mortality among patients.

This article discusses the key mechanisms of gastric mucosal damage development in patients on mechanical ventilation, including barrier function impairment, tissue ischemia, inflammatory reactions, and the impact of drug therapy. Modern approaches to the prevention and treatment of these conditions are described, including the use of antisecretory drugs, normalization of water-electrolyte balance, and provision of adequate tissue perfusion. Understanding these processes and timely intervention can reduce the incidence of complications and improve treatment outcomes in critically ill patients.

Keywords: structural changes, morphological study, stress ulcers, drugs.

Introduction

The morphological state of the gastric mucosa in patients in critical condition and on artificial lung ventilation (ALV) is one of the key problems of intensive care. Disturbances in the structure of the gastric mucosa in critical conditions are an important factor affecting the prognosis of patients and the incidence of complications, such as gastrointestinal bleeding and stress ulcers. Studies conducted by both domestic and foreign scientists indicate a high incidence of erosive and ulcerative lesions of the gastric mucosa in patients in intensive care units and on artificial lung ventilation.

Stress ulcers, first described by Zollinger and Ellison (1955), occupy a central place among damages of the gastric mucosa in critical conditions. And studies of foreign authors [1] have shown that in patients in intensive care units the frequency of gastric bleeding can reach 5-25%, while pronounced changes in the mucosa are observed in 75% of such patients [2] .

Domestic researchers note that acute gastric injury syndrome (AGIS) is associated with hypovolemia, mucosal ischemia and microcirculation disorders that develop against the background of intensive care [3] .

In addition, it is important to consider the role of drug therapy, which can worsen the condition of the gastric mucosa. The use of nonsteroidal anti-inflammatory drugs (NSAIDs) and glucocorticoids, according to Vasiliev et al. (2008), contributes to the formation of deep ulcers and increases the risk of bleeding. Other factors, such as impaired regulation of acid-base balance and exposure to endotoxins, also play an important role in the pathogenesis of these disorders [4] .

Particular attention in modern research is paid to microscopic and macroscopic changes in the gastric mucosa. Clinical observations show that already in the first day of the patient's stay on mechanical ventilation, signs of edema, hyperemia and microerosions begin to appear, which can progress to deep ulcers (Jones et al., 2010). An important role in the development of these pathologies is played by local circulatory disorders, which lead to tissue ischemia and deterioration of the reparative processes of the mucosa (Schuster et al., 2007).

Modern approaches to the prevention and treatment of these conditions include the use of protocols for the early administration of antisecretory drugs, as well as the normalization of water-electrolyte balance and maintaining adequate tissue perfusion [5] . The works of both domestic and foreign authors emphasize the need for an individual approach to the choice of therapeutic agents, which is associated with the polyetiology of mucosal damage in critically ill patients (Smith et al., 2014; Ivanov et al., 2019).

Thus, the study of morphological changes in the gastric mucosa in patients on mechanical ventilation is important for improving treatment outcomes. The introduction of modern diagnostic methods and the development of effective preventive strategies, including the use of antisecretory drugs and normalization of microcirculation, remain relevant areas of scientific research.

Objective of the study: To study the clinical and morphological features of the stomach of patients in serious condition who are on artificial ventilation.

Materials and methods. The work is based on statistical and retrospective analysis of the conducted studies.

to examine these patients. According to the diagnostic algorithm, clinical and laboratory examination methods, ultrasound and endoscopic examination of the gastrointestinal tract were performed.

Results of the discussion.

The age structure of hospitalized patients was dominated by elderly patients aged 60 to 74 years, which amounted to 52% of the total number, emphasizing the significant influence of age on the severity of the condition. Most often, patients with acute cerebrovascular accidents (ACVA), both first-time (16 cases) and repeated (7 cases), were admitted to intensive care, which is 75% of all seriously ill patients. Among patients with multiple injuries (6 people), the majority were men, which confirms the known fact of a higher risk of serious injuries among the male population.

Analysis of respiratory support parameters revealed that a significant proportion of patients required mechanical ventilation (MV) — 34 out of 50 people, demonstrating the seriousness of their condition. Of these patients, 26 were intubated via an endotracheal tube, and 8 had a tracheostomy inserted, indicating severe respiratory dysfunction. Reasons for switching to MV included upper airway obstruction, severe respiratory depression, and apnea, making spontaneous breathing impossible.

Attention was focused on the gastrointestinal tract (GIT) in critically ill patients. Patients with multiple injuries and acute surgical pathologies, such as acute pancreatitis with diffuse peritonitis, peptic ulcer disease, and cholelithiasis, developed serious complications requiring immediate surgical intervention and intensive care. Long-term stay on mechanical ventilation was often accompanied by gastrointestinal disorders associated with both the underlying disease and complications, such as gastrointestinal bleeding and stress ulcers, which complicated the course of the disease and increased the length of stay in the department, requiring a multidisciplinary approach to treatment.

Morphological studies of the gastric mucosa in patients on mechanical ventilation revealed significant pathological changes associated with the underlying disease and the need for long-term ventilation. In 34 patients on mechanical ventilation, the histological study revealed structural changes in the gastric mucosa. Most patients showed inflammatory changes indicating the development of gastritis or other inflammatory processes that were aggravated by the critical condition.

Histological studies demonstrated degenerative changes in epithelial cells, which is probably associated with hypoxia and general deterioration of the condition against the background of the underlying disease. Some patients had mucosal erosions indicating damage to the barrier function of the stomach caused by both the underlying pathology and complications associated with prolonged mechanical ventilation. These changes can contribute to the development of ulcerative processes, especially in patients with concomitant gastrointestinal diseases.

Histological analysis also revealed vascular changes in the gastric mucosa, which are likely associated with a systemic inflammatory response and microcirculation disorders often observed in critically ill patients. These vascular changes increase the disruption of the gastric barrier function, which increases the risk of bleeding and other complications. Thus,

morphological changes in the gastric mucosa in patients on mechanical ventilation require close monitoring and appropriate therapy.

Conclusion

Morphological changes in the gastric mucosa in critically ill patients on mechanical ventilation (MV) are characterized by significant disturbances that are caused by both the severity of the underlying disease and the specifics of intensive care. With prolonged use of mechanical ventilation, destructive processes such as edema, hyperemia, erosions, and ulcers of the gastric mucosa are observed. These changes can be caused by both physical (**hypovolemia** , microcirculation disorders) and chemical factors (drug exposure, changes in acid-base balance). Disturbances in the regulation of gastric secretion and the effects of drugs such as non-steroidal anti-inflammatory drugs and glucocorticoids contribute to further deterioration of the mucosa, which can lead to the development of acute gastric injury syndrome (AGIS). It is important to consider that these pathological processes can significantly complicate the course of the underlying disease and lead to serious complications, including gastrointestinal bleeding and ulcer perforation. Understanding the mechanism of these changes, as well as their timely diagnosis, are crucial for optimal management of the patient's condition. This requires constant monitoring of the gastric mucosa and adequate preventive and therapeutic measures aimed at reducing the risk of complications and improving outcomes in critically ill patients. The key aspect is an individualized approach to the treatment of such patients, which should include both the prevention of stress ulcers and the correction of gastric secretion and microcirculation disorders.

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