

Mucus barrier correction as a target in complex treatment of gastroesophageal reflux disease

Abstract

The aim of our study was to evaluate the clinical efficacy of esophageal mucus barrier correction by complex treatment with sodium hyaluronate and sodium alginate (Hyalera/Gastropiù Bustine) application in patients with gastroesophageal reflux disease (GERD). We conducted a multicenter, randomized, open, comparative study with parallel monitoring to evaluate the effectiveness and safety of combination therapy for patients with GERD using the sodium hyaluronate and sodium alginate (Hyalera/Gastropiù Bustine). Under our supervision, there were 72 patients with GERD aged 18 to 65 years. Women were 30 (41.7%), men 42 (58.3%). The criterion for inclusion in the study was the presence of GERD symptoms (primarily heartburn) with endoscopic and morphological confirmation. Omeprazole at a dose of 20mg 2 times a day and domperidone at a dose of 10mg 3 times a day were used as basic therapy in both groups. In the first group, an additional sodium hyaluronate and sodium alginate (Hyalera/Gastropiù Bustine) emulsion of 15ml sticks (Alpiflor, Italy) was prescribed. The emulsion was administered 1 stick after a meal 3 times a day.

The frequency of heartburn in the first group after treatment was almost three times lower than in the comparison group ($p = 0.035$) and they did not have nightly heartburn. Also, dysphagia was absent in the first group (almost 7% of patients remained in the second), at the same time, the incidence of belching after treatment was identical in both groups (20 and 17%). Endoscopically, in the second group, 4.5 times more often than in the first, esophagitis was detected, and in 1 patient it was erosive. Morphologically, in patients of the first group, significant positive dynamics was noted.

Keywords: GERD, gastroesophageal reflux disease, esophagoscopy, anti-inflammatory drugs, claudins, occludins, antisecretory therapy, ECG, alcoholism, drug addiction, varying degrees, papillomatosis cells, manifestations

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Abbreviations: GERD, gastroesophageal reflux disease; TJ, tight junctions; PPIs, proton pump inhibitors; NMAPE, national medical academy of postgraduate education; IHA, immunohistochemical assay

Introduction

Thus, mucus barrier correction in patients with GERD could be a perspective target of the treatment. In GERD patients the addition of a proton pump inhibitor, prokinetic, sodium hyaluronate and sodium alginate (Hyalera/Gastropiù Bustine) to standard therapy can significantly (compared with the control group) reduce the frequency and severity of heartburn, the degree of damage to the esophagus according to esophagoscopy, eliminate dysphagia and nocturnal heartburn. At the same time, modification of esophageal mucus barrier correlated with clinical improvement. Morphological changes in the esophageal mucosa, with decrease in the degree of inflammation and degeneration of the epithelium, an increase in the synthesis of protective mucus and the integration of the epithelium due to claudin 1 in tight junctions induce a clinical symptoms normalisation.

According to recent epidemiological studies, a quarter of the world's population experiences symptoms of gastroesophageal reflux disease (GERD), among which the most common is heartburn.¹ In Europe, the prevalence of this disease is irregular with a maximum in Greece (more than 51% of population) and a minimum in France (less than 10%).² There is a 50% increase in the number of such patients compared to 1990s.¹ Our country is not an exception, e.g.,

the incidence of GERD in Ukraine is 4.5-5.4 cases per 1000 people per year and its symptoms are observed in 15-21% of the population.³ Risk factors of GERD are well known: age over 50 years, smoking, overweight/obesity, intake of non-steroidal anti-inflammatory drugs and aspirin. A frequent combination of GERD with other diseases of the gastrointestinal tract and first of all with functional dyspepsia is also reported.^{1,2} An important component in the pathogenesis of GERD is a decrease in the tone of the lower esophageal sphincter with the reflux of acidic gastric contents into the esophagus. However, the ability of the esophagus mucosa to resist aggressive reflux and the quality of clearance (purification) of the esophagus wall from the acid refluxed into the stomach are no less important.^{4,5} In addition, there are differences in the pathogenesis of endoscopically positive and endoscopically negative reflux disease. This difference relates to different effectiveness of drugs that reduce the acidity of gastric contents when treating erosive and non-erosive GERD.⁶ As it turned out, in the case of a non-erosive form of reflux disease, the permeability of the esophageal mucosa is increased due to weakening of the integration of epithelial cells. The reason for this is a disruption of the tight junctions (TJ) of epithelial cells.⁷

A universal property of epithelial cells is to protect the internal environment of the body from damaging factors through the formation of the epithelial barrier. The surface of epithelial cells throughout the entire gastrointestinal tract is covered with a layer of mucus consisting mainly of mucins representing mainly glycoproteins. In the esophagus, the mucus produced by esophageal glands and goblet cells, together with bicarbonate, protein, ammonium and other saliva