Nonspecific marker of non-erosive reflux disease

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Non-erosive reflux disease (NERD) is the most common disorders of the gastrointestinal tract. However, diagnosis of NERD is not objective. A research group in China investigated esophageal mucosal damage in response to various factors, and revealed that acute stress and aspirin induced dilated intercellular spaces (DIS) in esophagus uncorrelated with acid reflux, suggesting that DIS is a nonspecific marker of NERD.

Gastroesophageal reflux disease (GERD) is an important public health problem which is extremely common nowadays. Symptoms of GERD arise from the exposure of increased acid gastric contents into the lower part of the esophageal mucosa. Most patients with GERD have NERD with invisible mucosal damages under endoscopy. There is not a gold standard to diagnose NERD due to the poor sensitivity, specificity, and reproducibility of many existing methods. Dilated intercellular spaces (DIS) in the esophageal epithelium have been a recent research hotspot. DIS has been considered as a feature of esophageal epithelial damage induced by gastric acid reflux, and serves as a marker for new methods to diagnose NERD. Studies have highlighted the importance of refluxed gastric acid in esophageal epithelial DIS. Until now, the specificity of DIS has been questionable.

A research article to be published on March 7, 2010 in the World Journal of Gastroenterology addresses this question. The research team, led by Professor Zhou from Peking University Third Hospital, used transmission electron microscopy to evaluate the esophageal mucosal damages in response to various factors in rats, including acute stress,

hydrochloric acid, ethanol, aspirin, and prednisolone.

Five damaging factors produced no lesions or inflammation in esophageal mucosae of rats, whether under gross or routine histological inspections. Esophageal epithelial intercellular space diameters in stress and aspirin groups were significantly greater, nearly three or two-fold respectively, than those in their corresponding control groups. These findings indicate that acute stress and aspirin can induce DIS of the esophageal epithelium in rats, and DIS appears before changes that can be seen in gross and routine histological inspections. Further study showed no significant difference in the intercellular space diameters between the group pretreated with esomeprazole to inhibit gastric acid secretion and the control group, in both stress and aspirin models, suggesting that DIS induced by acute stress and aspirin is not correlated with acid reflux.

By showing that DIS is not related solely to acid reflux, this study suggests that DIS is an early and sensitive, but nonspecific, ultrastructural feature of NERD. These results are beneficial for the diagnosis and differential diagnosis of NERD, and provide useful information for further study on the mechanism of this disease.

More information: Zhang DH, Zhou LY, Dong XY, Cui RL, Xue Y, Lin SR. Factors influencing intercellular spaces in the rat esophageal epithelium. World J Gastroenterol 2010; 16(9): 1063-1069 www.wjgnet.com/1007-9327/16/1063.asp

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