NPs-NPR-B/pGC-cGMP signal pathway is involved in diabetic gastroparesis

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The natriuretic peptide (NP) receptor type B (NPR-B) gene was expressed in gastric smooth muscles of normal and diabetic rats and the expression was increased in diabetic rats. These results suggest that natriuretic peptide-dependent pGC-cGMP signal is up-regulated and it may contribute to diabetic gastroparesis in STZ-induced diabetic rat.

Gastroparesis (delayed gastric emptying) is frequent in diabetic patients. It is a well-recognized complication of long-standing diabetes. Symptoms of diabetic gastropathy can range from mild dyspepsia to recurrent vomiting and abdominal pain and may progress to irreversible end-stage gastric failure known as gastroparesis. Gastroparesis seriously affects the quality of life. There is deterioration in glycemic control and incapacitating symptoms such as malnutrition, water and electrolyte imbalance, and aspiration may occur. However, the pathophysiology of diabetic gastropathy and gastroparesis, including impaired fundic and pyloric relaxation and impaired electrical pacemaking, is still not delineated.

A research article to be published in volume 15, May 7, 2009 in the World Journal of Gastroenterology addresses this question. The research team led by Professor Zheng Lin from Department of Physiology, Yanbian University College of Medicine, used physiological, radioimmunoassy and histochemistry techniques to study the role of the NPs-NPR-B/pGC(particulate guanylate cyclase)-cGMP signal pathway in the pathophysiology of diabetic gastropathy and gastroparesis in streptozotocin (STZ)-induced diabetic rats.

This study has indicated that the CNP-induced relaxation and the production of cGMP of gastric smooth muscle were potentiated in STZ-induced diabetic rats. In addition to the activity of pGC, the expression of NPR-B mRNA in gastric smooth muscle was up-regulated in diabetic rats. These results suggest that the CNP-(NPR-B)-pGC-cGMP signal pathway may be involved in the pathogenesis of diabetic gastroparesis.

More information: Cai YL, Xu DY, Li XL, Qiu ZX, Jin Z, Xu WX. C-type natriuretic-peptide-potentiated relaxation response of gastric smooth muscle in streptozotocin-induced diabetic rats. World J Gastroenterol 2009; 15(17): 2125-2131
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