

DIABETIC ALTERATIONS OF INTERSTITIAL CELLS OF CAJAL

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Interstitial cells of Cajal (ICC) are the cells originating from mesenchyma that represent only 5% of the cells in the musculature of the gastrointestinal tract (GIT), but they play an important and critical role in smooth muscle function and GIT motility regulation. Absence, reduction or structural alteration of ICC subpopulations are observed in several human gut disorders. This review aims to briefly summarize the current data on morphological and pathophysiological features of ICC subpopulations in the diabetic animal models and in patients. Diabetes mellitus (DM) is a well-known cause of gastroenteropathy and gastrointestinal dysmotilities which occur in up to 30–50% of patients after 10 years of type I or II diabetes. A loss or dysfunction of ICC has been shown to lead to higher basal tone of the lower esophageal sphincter with spontaneous contractile activity and impaired relaxation, gastric dysrhythmias, gastroparesis, slow intestinal transit, impaired neuroeffector mechanisms with altered visceral afferent signaling in various human dysmotilities and in animal models. The importance of ICC is becoming more evident in diabetic gastrointestinal dysmotility. ICC alterations were associated with gastrointestinal motility disorders in diabetes, such as reduced and arrhythmic slow wave pacing activity and decreased muscle response to the activation of enteric motor neurons. The mechanism of ICC disturbances is multifactorial and the interaction between these factors is a complex one. The pathogenesis of ICC loss includes increased oxidative stress, reduction in growth factors, change in intracellular signaling pathways and regulatory factors. Each of these factors could provide a potential therapy for diabetic gastrointestinal neuropathy.

Acta Medica Medianae 2017;56(4):100-107.

Key words: *diabetes, Cajal cells, gastroenteropathy*