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DIABETES

IL-6 mediates the protective effects of exercise on β cells

Exercise decreases inflammation, oxidative stress and apoptosis in pancreatic β cells through a signalling pathway involving IL-6, shows a new study in mice.

Exercise improves glucose control in patients with type 1 diabetes mellitus (T1DM). In experimental models of T1DM, exercise has antioxidant and anti-inflammatory effects and preserves the viability of β cells. Exercise also increases insulin content and insulin secretion in these cells. The mechanisms underlying these effects are, however, not clear.

Claudio Zoppi and colleagues isolated islets from mice that had undergone exercise training or no exercise and subjected them to the action of inflammatory cytokines. They also used serum of trained or control mice, or medium from cells treated with the AMPK activator AICAR, to treat pancreatic islets of control mice and two different β-cell lines. "We concluded that exercise training impairs β-cell death in our model of T1DM by lowering expression of inducible nitric oxide synthase, production of nitric oxide and reduced levels of cleaved caspase-3," says Zoppi.

Experiments involving analysis of islets from mice with an IL-6 knockout, use of serum of these mice in wild-type islets exposed to inflammatory markers and use of an IL-6 inhibitor on these cells showed that IL-6 is necessary to mediate the effects of exercise on the viability of β cells. "The crosstalk between skeletal muscle and pancreatic β cells is achieved through contraction-released IL-6," concludes Zoppi.

"We intend to investigate drugs that may activate IL-6 signalling to counteract β-cell death in T1DM," adds Zoppi.

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Original article Paula, F. M. *et al.* Exercise increases pancreatic β-cell viability in a model of type 1 diabetes through IL-6 signaling. *FASEB J.* doi:10.1096/fj.14-264820