The interleukin-1 receptor antagonist anakinra improves first phase insulin secretion and insulinogenic index in subjects with impaired glucose tolerance

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Abstract

Inflammation at the level of the β cell appears to be involved in progressive β-cell dysfunction in type 2 diabetes. We assessed the effect of blocking interleukin-1 (IL-1) by anakinra [recombinant human interleukin-1 receptor antagonist (IL-1Ra)] on β-cell function. Sixteen participants with impaired glucose tolerance were treated with 150 mg anakinra daily for 4 weeks in a double blind, randomized, placebo-controlled cross-over study with a wash-out period of 4 weeks. At the end of each treatment period, oral glucose tolerance tests (OGTTs) and hyperglycaemic clamps were performed. First-phase insulin secretion improved after anakinra treatment compared with placebo, 148 ± 20 versus 123 ± 14 mU/l, respectively (p = 0.03), and the insulinogenic index was higher after anakinra treatment. These results support the concept of involvement of IL-1β in the (progressive) decrease of insulin secretion capacity associated with type 2 diabetes.

Keywords: diabetes mellitus; drug mechanism; experimental pharmacology; type 2 diabetes; β cell.