

Gene expression of inflammatory cytokines in the peripheral leukocytes are altered by chronic and acute postprandial hyperglycemia in rats

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Postprandial hyperglycemia is thought to cause inflammation in many tissues. In this study, we examined whether the gene expression of inflammatory cytokines in peripheral leukocytes are altered by chronic and/or acute postprandial hyperglycemia.

Seven-week-old male Wistar rats treated with streptozotocin (35 mg/kg BW) received a control diet or a diet containing α -glucosidase inhibitor, miglitol (800mg/kg diet) for 20 days. In another experiment, rats with mild glucose intolerance received a daily single oral dose of sucrose (2 g/kg BW). Blood was collected from tail vein, and the total RNA extracted from peripheral leukocytes was subjected to microarrays and real-time RT-PCR.

Microarray analysis of the genes in peripheral leukocytes showed that gene expression of IL-1 β and putative inflammatory cytokines, S100 a4/6/8/9, were induced in hyperglycemic rats. Dietary supplementation with miglitol suppressed the induction of these inflammatory cytokine genes. Oral sucrose loading in rats with mild glucose intolerance led to a 2-fold increase in IL-1 β gene expression in peripheral leukocytes within 3h, which was abolished by addition of miglitol to the sucrose solution.

These results suggest that the gene expression of inflammatory cytokines in peripheral leukocytes are altered not only by chronic hyperglycemia but also by acute postprandial hyperglycemia.