

Evaluation of Bcl-2 family gene expression and Caspase-3 activity in hippocampus STZ-induced diabetic rats.

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Abstract

We assessed the expression of Bcl-2 family members at both mRNA and protein levels as well as the Caspase-3 activity, in order to investigate the occurrence of apoptosis in hippocampus of STZ-induced diabetic rats. We selected twenty-four Wistar rats; half of them were made diabetic by intraperitoneal injection of a single 100 mg/kg dose of streptozotocin (STZ, IP), while the others received normal saline and served as controls. The expressions of Bcl-2, Bcl-x(L), and Bax mRNA and proteins were measured using RT-PCR and western blotting, respectively. Caspase-3 activity was determined by using the Caspase-3/ CPP32 Fluorometric Assay Kit. The result showed that mRNA and protein levels of Bcl-2 and Bcl-x(L) were lower in hippocampus of diabetic group than that of the control group, whereas expressions of Bax in hippocampus of diabetic rats were higher than that of controls at both mRNA and protein levels ($P < .01$). Hyperglycemia was found to raise 1.9-fold hippocampal caspase-3 activity in diabetic group compared with control group ($P < .001$). Therefore, the induction of diabetes is associated with increased ratios of Bax/Bcl-2, Bax/Bcl-x(L), and increased caspase-3 activity in hippocampus which shows that apoptosis is favored in hippocampal region.

Reaxys Database Information

Indexed Keywords

EMTREE drug terms: Bax protein, rat; Bcl2 protein, rat; Casp3 protein, rat; caspase 3; messenger RNA; protein Bax; protein bcl 2; protein bcl x; streptozocin; tissue extract; unclassified drug

EMTREE medical terms: animal; apoptosis; article; drug effect; experimental diabetes mellitus; gene expression regulation; genetics; hippocampus; male; metabolism; multigene family; proto oncogene; rat; Wistar rat

MeSH: Animals; Apoptosis; bcl-2-Associated X Protein; bcl-X Protein; Caspase 3; Diabetes Mellitus, Experimental; Gene Expression Regulation; Genes, bcl-2; Hippocampus; Male; Multigene Family; Proto-Oncogene Proteins c-bcl-2; Rats; Rats, Wistar; RNA, Messenger; Streptozocin; Tissue Extracts

Medline is the source for the MeSH terms of this document.

Chemicals and CAS Registry Numbers: caspase 3, 169092-06-7; protein bcl 2, 2193-6-68-0; streptozocin, 18883-76-4; tissue extract, 1390-94-9, 801-49-8, 9007-22-3; Bax protein, rat; Casp3 protein, rat, 3,4,22.-; Caspase 3, 3,4,22.-; Proto-Oncogene Proteins c-bcl-2; RNA, Messenger; Streptozocin, 18883-76-4; Tissue Extracts; bcl-2-Associated X Protein; bcl-X Protein

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