IDENTIFICATION OF CHANGED PROTEINS ON HYPERGLYCEMIA IN MIDDLE CEREBRAL ARTERY OCCULSION ANIMAL MODEL

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Diabetes is a metabolic disorder that has a major risk factor for ischemic cerebrovascular disease. Diabetic patients have at least two fold higher dangerousness of stroke than non-diabetic normal, and also have increased mortality and morbidity after stroke. The aim of this study is to investigate different expression of proteins and their roles in brain ischemic injury between normal and diabetic rats. Adult male rats (210~250g) were treated with streptozotocin (40mg/kg) to induce diabetes. After one month, diabetic and non diabetic rats were induced cerebral ischemic injury by middle cerebral artery occlusion (MCAO). The animals were killed 24 h after MCAO to harvest brain tissue. Proteomics was performed to compare different patterns of proteins in non-diabetic and diabetic brain ischemic injury. Changed proteins between two groups were identified MALDI-TOF technique. Silver stained gel image shown about 1200 protein spot. In these spots, forty-six protein spots were differentially expressed in both non-diabetic and diabetic brain ischemic injury. Forty-two spots in changed proteins were identified by MALDI-TOF. Four protein spots remained unknown. Diabetes leads to up-regulation of C3 and annexin A3 in brain ischemia. Diabetes induces down-regulation of various proteins in brain ischemia; PEA-15, 14-3-3, hippocalcin, parvalbumin, ICDH, GAPDH, Adenosylhomocysteinase, albumin, Peroxiredoxin-2, Neuroleukin, pyruvate kinase, α-synuclein, UCHL1 and Rab GDIα. This study suggests that diabetes may exacerbate brain ischemic injury via mediating up-regulation and down-regulation of many proteins.

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