INSULIN RESISTANCE AND NEUROCOGNITIVE FUNCTION

- abstract –

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Insulin which is known as the most important glucoregulatory hormone secreted by the endocrine beta-pancreatic cells, do not act only in the peripheral tissues, but as it has clearly been demonstrated during the last two decades it act also in the CNS, where it has important roles both related to the glucose transport across the blood-brain barrier (BBB), but specific metabolic, neurotrophic and antiinflammatory activities. The peripheral insulin of pancreatic origin crosses the BBB in a tightly controlled manner, as the BBB expresses insulin receptors, which number may decrease related to specific conditions associated with chronic hyperinsulinemia and insulin resistance. This impairs the normal activity of the brain, as both experimental and clinical non-interventional studies have identified correlations between the insulin and cognitive functions – in particular memory, but also increased insulin resistance in a significant number of patients with neurodegenerative diseases; the most studied clinical correlations are related to Alzheimer’s disease, but there are data suggesting a role of insulin resistance also in Parkinson’s diseases, Huntington’s disease, some forms of spino-cerebellar atrophies, and others. These implications could be related to the role of insulin in the normal APP and beta-amyloid cellular synthesis and processing, but also in the brain-liver metabolic axis. These data will be presented and also the new perspectives of understanding the role of insulin and insulin receptors in the CNS, in normal and pathologic conditions.

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