Brain insulin signaling malfunction as a consequence of prenatal stress exposure can accelerate Alzheimer like phathology in icv-STZ rat model of sAD

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Background and Aim : Dysregulated brain insulin signaling has been foregrounded to play an important role in Alzheimer 's (AD) pathology. Subclinical icv- STZ model (intracerebroventricularly streptozotocin injection, icv-STZ) has been introduced based on this observation. Astrogliosis and central insulin resistance have Suggested as an icv- STZ mechanism. Increasing evidence support the effect of environmental factors, such as stress and intrinsic factors like insulin resistance, in the etiology of sporadic Alzheimer 's (sAD). Based on the glucocorticoid basis of brain aging, stress can promote hippocampus aging and even AD. Prenatal stress can induce diverse life events such as depression and memory disorders. However, its potential to promote sAD pathology has not yet investigated.

Methods : In this study, the effect of prenatal stress on exacerbation of insulin signaling impairments was investigated using subclinical sAD model. A subclinical sporadic Alzheimer's model was induced using icv-STZ0.5mg/Kg injection in 3-month-old rats. A set of different stressors was applied in late pregnancy. 3-month-old male springs received single icv-STZ injection and animal's hippocampus was extracted 2.5 months later. Using Real-Time RT-PCR the expression levels of insulin-related genes was compared.

Results : As compared with control, there was a significant rise in insulin receptor gene expression in prenatally stressed group. Also, molecular data from prenatal stress+icv-STZ group showed a significant increase in insulin receptor and tau transcripts and the reduction in ChAT expression levels as compared with icv-STZ-treated animals.

Conclusion : This results show that prenatal stress can accelerate insulin signaling malfunction in subclinical rat model of sAD and so act as a sAD risk factor.

Keywords : Prenatal stress, Sporadic Alzheimer 's, insulin signaling, icv-STZ, rat