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Analysis of NMDA Receptor 2B Subunit Gene (GRIN2B) mRNA Expression in the Peripheral Blood Mononuclear Cells of Alzheimer's Disease Patients

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Abstract : N-methyl-D-aspartate (NMDA) receptor is a subtype of glutamate receptor and plays a pivotal role in learning, memory, neuronal plasticity, neurotoxicity and synaptic mechanisms. Animal experiments were suggested that glutamate-induced excitotoxic injuriy and NMDA receptor blockage lead to amnesia and other neurodegenerative diseases including Alzheimer’s disease (AD), Huntington’s disease, amyotrophic lateral sclerosis. Aim of this study is to investigate association between NMDA receptor coding gene GRIN2B expression level and Alzheimer disease. The study was approved by the local ethics committees, and it was conducted according to the principles of the Declaration of Helsinki and guidelines for the Good Clinical Practice. Peripheral blood was collected 50 patients who diagnosed AD and 49 healthy control individuals. Total RNA was isolated with RNeasy midi kit (Qiagen) according to manufacturer’s instructions. After checked RNA quality and quantity with spectrophotometer, GRIN2B expression levels were detected by quantitative real time PCR (QRT-PCR). Statistical analyses were performed, variance between two groups were compared with Mann Whitney U test in GraphpadInstat algorithm with 95 % confidence interval and $p < 0.05$. After statistical analyses, we have determined that GRIN2B expression levels were down regulated in AD patients group with respect to control group. But expression level of this gene in each group was showed high variability. İn this study, we have determined that NMDA receptor coding gene GRIN2B expression level was down regulated in AD patients when compared with healthy control individuals. According to our results, we have speculated that GRIN2B expression level was associated with AD. But it is necessary to validate these results with bigger sample size.

Keywords : Alzheimer’s disease, N-methyl-d-aspartate receptor, NR2B, GRIN2B, mRNA expression, RT-PCR
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