The effect of Vitamin A on gene expression of Dnmt3a and Dnmt3b involved in neural stem cell differentiation into oligodendrocyte

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Multiple sclerosis is a debilitating disease of the central nervous system that has been characteristically classified as an immune-mediated destruction of myelin, the protective coating on nerve fibers. In stark contrast to the situation that follows loss of neurons or axonal damage, remyelination in the CNS can be a highly effective regenerative process. It is mediated by a population of precursor cells called oligodendrocyte precursor cells (OPCs), which are widely distributed throughout the adult CNS. DNA methylation is known to regulate cell differentiation and neuronal function. DNMT3A encodes a DNA methyltransferase essential for establishing methylation during embryogenesis The de novo DNA methyltransferase DNMT3B functions in establishing DNA methylation patterns during development. Retinoids (vitamin A) have important roles in the developing nervous system. They can mediate this function by regulating the expression of several genes. A retinoic acid receptor (RAR) comprises ligand-dependent transcription factors that regulate gene expression. The aim of this study was to evaluate the effect of vitamin A on oligodendrocyte differentiation. Rat embryonic stem cells were cultured and RT-PCR assay was done with total RNA from four samples including control negative (PDGF +bFGF), control positive (laminin) and two treatments consist of vitamin A and vitamin A + laminin. Simultaneously, we study one housekeeping gene, GAPDH, to control the errors. We transmit the bands of Gel Electrophoresis to quantitative data by Gel Analyzer software. Then, compare the data of treatment groups with controls by using Kruskal Wallis and Mann-Withney U tests in SPSS . In conclusion, the results of this study suggested that there are no significant statistical changes in expression of Dnmt3a and Dnmt3b due to this vitamin ($P>0.05$).

Keywords: Multiple sclerosis, Remyelination, Oligodendrocyte, DNMT3A, DNMT3B, Retinoids