

Title: The Effect of Vitamin D Treatment on Vitamin D Receptors Expression in Cultured Primary Cortical Neurons in Induced Oxidative Stress

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Abstract

Earlier studies in our lab demonstrated that vitamin D_3 confers protection to the primary cortical neuronal cells in culture by upregulating glutathione levels and the antioxidants enzymes such as GST and catalase. Nuclear receptors are a family of transcription factors involved in multiple physiological functions. The VDR is a member of this superfamily and found to be widely distributed in the central nervous system, thus regulating critical aspects of neuronal integrity. The aim of this research was to study the effect of vitamin D_3 treatment on vitamin D receptor (VDR) expression in the presence and absence of induced oxidative stress. Primary Cortical neuronal cells were extracted from neonatal rats, and cultured with and without vitamin D pre-treatment (0.25 µg/ml) and grown for different time periods. After that, the cells were exposed to 0.25 mM for H_2O_2 for 2h to induce oxidative stress. Control neuronal cells were grown in similar conditions for a similar period of time without any treatment. The H_2O_2 treated group were grown without any Vitamin D_3 treatment but exposed to 0.25mM for 2h. Western blotting and in cell western (ICW) were used to estimate the expression of VDR. Immunofluorescence was used as well to look for the presence of VDR localization. Our results showed that with the vitamin D3 treatment the VDR receptor expression is upregulated, resulting in greater protection of the neuronal cells against the induced oxidative stress. Immunofluorescence studies further supported our study. The VDR expression was more visible in vitamin D_3 treated cells as compared to H_2O_2 treated cells only.

Biography

Ebtesam Alsulami is a final year master student from king Saud University – Department of Biochemistry . She is working on the expression of VDR expression in primary cortical neuronal cultures under the supervision of Dr. Samina Hyder Haq. Dr. Samina is a Senior Biochemist by profession, having completed a Doctorate in Biochemistry from the Medical School, University of Manchester, United Kingdom. She is an experienced Biochemistry and Molecular Biology researcher.

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