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CONFERENCE PLENARY LECTURES

VITAMIN D AND NERVOUS DISEASES

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Several epidemiological and clinical studies suggest that vitamin D₃, especially calcidiol (25-hydroxy vitamin D₃), is a risk factor in several chronic diseases. Vitamin D metabolites are recently identified as active neurosteroids in the central nervous system. Neural cells contain significant amount of nuclear vitamin D receptors (VDR). Cells of the CNS, especially glial cells, are able to metabolize vitamin D to more active hormonal forms. Vitamin D insufficiency increases risk of multiple sclerosis (MS). There is also a geographical correlation with the incidence of MS-disease. The disease is practically absent in equatorial areas and its incidence is increasing towards the poles. Furthermore, MS is less prevalent in populations living at high mountains. We have performed a preliminary study on the effect of vitamin D on MS-patients analysing EEG and neuropsychological tests. Vitamin D is a potential therapy for several diseases of the CNS such as MS, seasonal affective disorder, Parkinson's and Alzheimer's diseases. We have also studied VDR-deficient mice using several behavioural tests and analysing histologically brains of the animals. VDR-KO mice appear to be more anxious than the wild type mice, and some specific motoric functions are also affected in these mutants. In addition, some brain dysfunctions have been revealed in the brains of these mice during the neuromorphological examination. Overall, we conclude that vitamin D appears to be a neuroactive hormone/paracrine factor which is important for normal development and differentiation of the brain, and which affects behaviour and motor functions.