DIFFERENT VULNERABILITY TO CYTOTOXICITY AND SUSCEPTIBILITY TO PROTECTION OF PROGENITORS VERSUS MATURE OLIGODENDROCYTES

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Oligodendrocytes are known to be particularly vulnerable to the cytotoxic effect evoked by different neurodegenerative processes, such as ischemic insult, hypoxia, hypoglicemia or autoaggressive immunological attack like SM. They are the neural cells that undergo sophisticated process of maturation characterized by huge changes in cell metabolism and morphology. Small bipolar cells differentiate into multiprocessed mature oligodendrocytes capable of myelinating CNS. A question arises whether there are any differences in their sensitivity to excitotoxic events? To address this problem, the cells of two distinct stages of differentiation, i.e. progenitors (O-2A) and mature, myelinating oligodendrocytes (MBP+) were selected for investigation of the effects of such apoptogenic factors as H2O2 or serum-withdrawal in vitro. Primary cultures obtained from the brain hemispheres of 18 days old Wistar rat embryos served after 10 days for the establishing pure oligodendrocyte culture (the “shake-off” method by McCarthy and de Vellis, 1980). Oligodendrocytes were cultured in DMEM with addition of insulin, transferrin and sodium selenite. Cytotoxic influence of selected apoptotic factors as well as neuroprotective effects of CsA were estimated by immunochimical detection. The obtained data suggest that progenitors and mature cells respond to apoptogenic conditions by activation of different molecular pathways and specific cytoprotective conditions should be worked out for each type of the cells.

Key words: oligodendrocytes, cytotoxicity, apoptosis, CsA, cytoprotection