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AGE-DEPENDENT ROLE OF NMDA RECEPTORS IN EXPERIMENTAL AUTOIMMUNE ENCEPHALOMYELITIS

POSTER SESSION 05 - SECTION: NEUROINFLAMMATION AND AUTOIMMUNITY

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Aims Ageing affects *N*-methyl-D-aspartate receptors (NMDARs), their expression and function in neuronal and non-neuronal cells. Contribution of NMDARs to pathogenesis of experimental autoimmune encephalomyelitis (EAE) has been investigated but further study is still needed. The aim of this study was to determine whether ageing affects the role of NMDARs in EAE. Methods Memantine, a non-competitive NMDAR antagonist which limits pathological activity of NMDARs while sparing normal synaptic activity, was administered orally from day 7 after immunization to 3- and 24-month-old female Dark Agouti rats. The animals were sacrificed at the peak of the disease. Spinal cord mononuclear cells were analyzed by flow cytometry. Brain tissue was collected for biochemical analysis of redox status and RT-qPCR. Results Semiprophylactic administration of memantine ameliorated clinical disease course, with greater effect in aged rats. Memantine reduced the number, frequency, and reactivation of CD4+ T lymphocytes and increased the relative percentage of CX3CR1-expressing microglia in spinal cord, but to a greater extent in aged rats. Additionally, analysis of brain redox status parameters showed that memantine was more effective in reducing superoxide anion radical, malondialdehyde and advanced oxidation protein products in aged rats than in young ones. In accordance with previous findings, NMDAR inhibition by memantine decreased NADPH oxidase and IL-1β expression and increased the nuclear factor erythroid 2-related factor 2 and heme oxygenase-1 expression, to a greater extent in aged rats. Conclusions The involvement of NMDARs in the pathogenesis of EAE was age-dependent, being more pronounced in aged than in young rats.