

DECREASED PERFORMANCE IN NEUROMUSCULAR COORDINATION AND BRAIN MITOCHONDRIAL ELECTRON TRANSFER UPON AGING

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Both aging and age-associated neurodegeneration are related to the development of behavioural impairments, consequently, decreased performance in neuromuscular coordination and exploratory activity tests are considered markers of neurological aging. Tightrope success and exploratory activity in a T-maze were conducted with 180 mice (male and female), the tests began when the mice were 13 weeks old, twice for month, in a longitudinal study and were extended for 65 weeks. Performance in behavioural tests decreased with age in both males and females, success was higher in females than in males from 13 to 78 weeks of age. Oxidative stress and mitochondrial electron transfer activities were determined in brain of young (28 weeks), adult (52 weeks) and old (72 weeks) mice in a cross-sectional study. Brain TBARS were increase by 50% in old mice, and were about 15% higher in males than in females. Brain Cu,Zn-SOD activity was increased by 52% and Mn-SOD by 108% in old mice. The activities of mitochondrial enzymes, NADH-cytochrome c reductase, cytochrome oxidase and citrate synthase, were decreased by 14-58% in old animals. The cumulative toxic effects of oxyradicals and their by-products are considered as the molecular mechanism of the behavioural deficits observed upon aging.