NEURO-PROTECTIVE ROLE OF ESTRADIOL IN AGING FEMALE RATS

P. Kumar, R.K. Kale, N.Z. Baquer

School of Life Sciences, Jawaharlal Nehru University, New Delhi, India

Biological aging is a fundamental process observed in almost all living beings. During aging the brain experiences structural, molecular, and functional alterations. Aging in females and males is considered as the end of natural protection against age related diseases like osteoporosis, coronary heart disease, diabetes, Alzheimer's disease and Parkinson's disease. These changes increase during menopausal condition in females when the level of estradiol (E2) is decreased. The objective of this study was to observe the changes in activities of membrane linked ATPases (Na⁺K⁺ ATPase, Ca²⁺ATPase), antioxidant enzymes (superoxide dismutase (SOD) glutathione-s-transferase (GST), intrasynaptosomal calcium levels, membrane fluidity and neurolipofuscin accumulation occurring in brains of female rats of 3 months (young), 12 months (adult) and 24 months (old) age groups, and to see whether these changes are restored to normal levels after exogenous administration of estradiol (0.1 µg/gm body weight for one month). The results obtained in the present work revealed that normal aging was associated with significant decrease in the activities of membrane linked ATPases, antioxidant enzymes and an increased in neurolipofuscin, intrasynaptosomal calcium levels in brain of aging female rats. The present study showed that E2 treatment brought these changes to near normalcy. E2 treatment appears to be beneficial in preventing age related disorders of the brain, an important target of anti-aging.