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 is decreased.

The objective of this study was to observe the changes in activities of monoamine oxidase, glucose transporter-4 levels, membrane fluidity, lipid peroxidation levels and lipofuscin 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 increases in the activity of monoamine oxidase, lipid peroxidation levels and lipofuscin accumulation in the brains of aging female rats, and a decrease in glucose transporter-4 level and membrane fluidity. Our data showed that estradiol treatment significantly decreased monoamine oxidase activity, lipid peroxidation and lipofuscin accumulation in brain regions of aging rats, and a reversal of glucose transporter-4 levels and membrane fluidity was achieved, therefore it can be concluded from the present findings that estradiol’s beneficial effects seemed to arise from its antilipofuscin, antioxidant and antilipidperoxidative effects, implying an overall anti-aging action.

The results of this study will be useful for pharmacological modification of the aging process and applying new strategies for control of age related disorders.