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Protective potential of 17 β -estradiol on oxidative stress and renal metabolism in Aged Female Rats

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Objectives: The objective of this study was to observe the changes in activity of antioxidant enzymes, renal glucose homeostasis, serum creatinine, urine output, urine microscopy, serum lipid profile, glomerular filtration rate and renal function occurring in kidney of female rats of 3, 12 and 24 months age groups, and to see whether these changes are restored to 3 months control levels rats after exogenous administration of steroid hormone estrogens (17- β -estradiol, E2).

Methods: The aged rats (12 and 24 months old) (n= 8 for each group) were given subcutaneous injection of 17beta estradiol (0.1 ug/g body weight) daily for one month. After 30 days of hormone treatment, experimental animals of all the groups were sacrificed and kidney were isolated for further study. A detailed study was carried on non-enzymatic glutathione (GSH) and enzymatic antioxidants [superoxide dismutase (SOD), glutathione peroxidase (GPX) and catalase (CAT)], glucose homeostasis, serum creatinine, urine output, urine microscopy, lipid metabolism and glomerular filtration rate.

Results: The results obtained in the present work revealed that normal aging was associated with significant decrease in the activities of antioxidant enzymes, glomerular filtration rate, serum expression, urine output, and an increase in glucose homeostasis, lipogenic enzymes, lipid profile and serum creatinine level increased significantly in kidney of aging female rats. Our data showed that exogenous administration of E2 brought these changes to near normalcy in aging female rats.

Conclusions: The present study showed that E2 treatment reversed the changes to normal levels. E2 treatment may be beneficial in preventing some of the age related changes in the kidney by increasing antioxidant defences and decrease oxidative stress. E2 plays important role in the progression of chronic renal diseases.