OBJECTIVE: The aim of this study was to investigate the anti-aging effects of estrogen on SIRT1 in ovariectomized rats.

METHODS AND MATERIALS: Thirty-three three-month-old female Sprague-Dawley (SD) rats were randomly but equally divided into three groups. Rats were anesthetized and bilateral ovariectomy was performed under general anaesthesia in all groups except for the sham operation group. Groups included: Sham-operated (Sham), ovariectomized (OVX), ovariectomized but treated with 0.21 mg/kg estradiol (Treated). Two other groups were given the equal physiological saline. Treatment was given once a day for 12 weeks with intragastric administration. The follicle stimulating hormone (FSH) and estradiol (E2) was detected in the blood of rats after 12 weeks. The heart, liver, and brain were removed after the rats were sacrificed. SIRT1 expression in these tissues of rats was analyzed by reverse transcriptional polymerase chain reaction (RT-PCR) and competitive enzyme-linked immunosorbent assay (ELISA).

RESULTS: Compared to the ovariectomized group, SIRT1 levels were significantly increased in the treatment group (P<0.05) and higher in the sham group in the heart, liver, and brain tissues of rats. SIRT1 expression was significantly higher in the heart than liver and brain in the treatment group (P<0.05).

CONCLUSION: Estrogen can significantly improve the SIRT1 protein and mRNA levels in the ovariectomized rats to delay senescence.