Abstract


Estrogen status alters tissue distribution and metabolism of selenium in female rats.

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OBJECTIVE: A reported association between estrogen and selenium status may be important in the regulation of selenium metabolism. In this study, the effect of estrogen status on the metabolism of orally administered (75)Se-selenite and tissue selenium status was investigated.

METHODS: Female Sprague-Dawley rats were bilaterally ovariectomized at 7 weeks of age and implanted with either a placebo pellet (OVX) or pellet containing estradiol (OVX+E2), or were sham operated (Sham). At 12 weeks of age, 60 µCi of (75)Se as selenite was orally administered to OVX and OVX+E2 rats. Blood and organs were collected 1, 3, 6 and 24 h after dosing.

RESULTS: Estrogen status was associated with time-dependent differences in distribution of (75)Se in plasma, red blood cell (RBC), liver, heart, kidney, spleen, brain and thymus and incorporation of (75)Se into plasma selenoprotein P (Sepp1) and glutathione peroxidase (GPx). Estrogen treatment also significantly increased selenium concentration and GPx activity in plasma, liver and brain, selenium concentration in RBC and hepatic Sepp1 and GPx1 messenger RNA.

CONCLUSION: These results suggest that estrogen status affects tissue distribution of selenium by modulating Sepp1, as this protein plays a central role in selenium transport.

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