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Hepcidin mediates estrogen-dependent changes in serum iron availability in humans

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Elevated levels of estrogen (E2) often associate with increased serum iron concentration; however, the mechanism underlying this relationship is not well-understood. As the peptide hormone hepcidin is a major regulator of iron absorption and release, this study aimed at investigating whether it is involved in E2-dependent changes in serum iron levels. Serum samples from 163 young females were separately assayed for the levels of E2, hepcidin-25, ferritin, iron, and total iron binding capacity. The sample population was divided into four groups based on E2 concentration; 0-0.49, 50-99, 100-199, and >199 pg/ml. Levels of E2 negatively correlated with those of hepcidin in all E2 groups; correlation was weakest at E2 levels of 0-49 ($P<0.039$) and strongest at E2 levels >199/pg/ml ($P<0.005$). A positive correlation was noted between E2 and ferritin in the >199 pg/ml E2 group ($P<0.05$); ferritin negatively correlated with E2 in all other E2 groups. No clear relationship between E2 and TIBC or serum iron concentration was evident. These results suggest that elevated levels of estrogen increase serum iron concentration by downregulating hepcidin synthesis.

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