

# Iron excess in recreational marathon runners

## Project: 366

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### Background and objectives:

Iron deficiency and anemia may impair athletic performance, and iron supplements are commonly consumed by athletes. However, iron overload should be avoided due to possible long-term adverse health effects.

### Methods:

We investigated the iron status of 170 male and female recreational runners participating in the Zürich marathon. Iron deficiency was defined either as a plasma ferritin (PF) concentration  $<15 \mu\text{g}\cdot\text{L}^{-1}$  (iron depletion) or as the ratio of the concentrations of transferrin receptor (sTfR) to PF (sTfR:log(PF) index) of  $\geq 4.5$  (functional iron deficiency).

### Results:

After excluding subjects with elevated C-reactive protein concentrations, iron overload was defined as  $\text{PF} > 200 \mu\text{g}\cdot\text{L}^{-1}$ . Iron depletion was found in only two out of 127 men (1.6% of the male study population) and in 12 out of 43 (28.0%) women. Functional iron deficiency was found in five (3.9%) and 11 (25.5%) male and female athletes, respectively. Body iron stores, calculated from the sTfR/PF ratio, were significantly higher ( $p < 0.001$ ) among male compared to female marathon runners. Median PF among males was  $104 \mu\text{g}\cdot\text{L}^{-1}$ , and the upper limit of the PF distribution in males was  $628 \mu\text{g}\cdot\text{L}^{-1}$ . Iron overload was found in 19 out of 127 (15.0%) men but only 2 out of 43 women (4.7%). Gender (male sex), but not age, was a predictor of higher PF ( $p < 0.001$ ).

### Conclusion:

Iron depletion was present in 28% of female runners but in less than 2% of males, while 1 in 6 male runners had signs of iron overload. Although iron supplements are widely used by athletes in an effort to increase performance, our findings indicate excess body iron may be common in male recreational runners and suggest supplements should only be used if tests of iron status indicate deficiency.

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