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Predictive models for iron status in postmenopausal women

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Introduction

Serum iron levels may contribute to health outcomes, but it may not be feasible to measure levels in large studies. A predictive model using factors known to be associated with iron levels may provide an alternative for studying health effects associated with iron.

Aim

Estimate associations between baseline serum iron levels and common iron predictors.

Study population

6,008 women from a case-cohort sample (including 2,808 later breast cancer cases) in the Sister Study

- Age 35-74 years at enrollment (2003-2009)
- Subset to participants who were postmenopausal at study entry (n=2,088)

Methods

Regression models: Use either linear or spline models, depending on fit.

Serum measures:

- Iron (mg/dL)
- Ferritin (mg/dL)
- Transferrin Saturation (%) = $\frac{Iron}{Iron+UIBC} \cdot 100$, UIBC=unsaturated iron-binding capacity

We verified many common predictors of iron status in a sample of post-menopausal women, but they explained a small percent of overall variance of serum iron measures commonly used in clinical practice.

Take a picture to download the digital poster.

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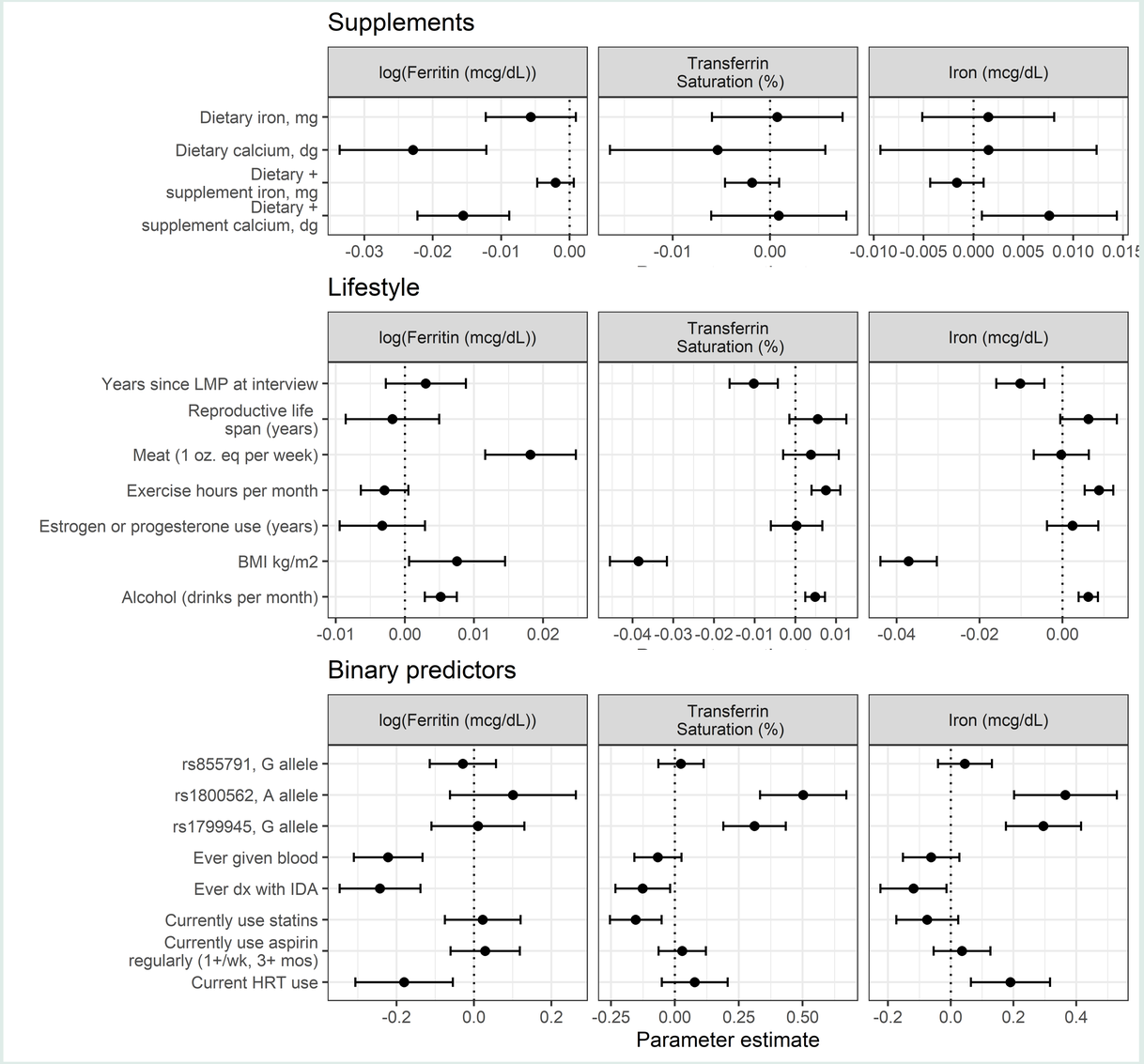
Results

Figure 1. Simple linear regression coefficients for common predictors of standardized serum iron levels.



Notes: All models are adjusted for age at baseline. Outcomes are standardized with mean=0 and sd=1. BMI: Body Mass Index. HRT: Hormone Replacement Therapy. IDA: Iron deficiency anemia. LMP: Last menstrual period.

⇒ We confirmed prior associations with **ferritin**:
- positive associations with red meat consumption, BMI, and alcohol.
- Inverse associations with blood donation, HRT, and iron deficiency anemia.

⇒ Patterns are similar across iron measures except for BMI, exercise, hormone replacement therapy, and dietary and supplemental calcium; direction of associations with **transferrin saturation** and **iron** are opposite those with **ferritin**.

Table 1. Proportion of variance in outcome explained by predictors (from figure 1)

Measure	R^2
Ferritin (mg/dL)	0.09
Transferrin Saturation (%)	0.08
Iron (mg/dL)	0.07

None of the multivariable models explain more than 10 percent of the variance (Table 1). These low percentages suggest low predictive performance of these models.