

## **In obese women, increased blood volume and reduced serum iron partially explain the higher risk for iron deficiency.**

### **Project 458**

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**Background:** Excess weight, has been suggested to lead to increased blood volume (BV) which may explain lower serum iron (sFe) concentrations observed in obese individuals.

**Objective:** This observational study compares BV in normal-weight (NW) versus overweight (OW) and obese (OB) healthy, non-anemic women (n=62) (BMI 18.5-39.9 kg/m<sup>2</sup>). We examined if differences in BV might explain the reduced sFe in OW/OB women. Additionally we develop an equation to calculate BV in OW/OB women.

**Design:** We assessed body composition by dual energy X-ray absorptiometry (DXA), ironstatus, inflammation and BV by the carbon monoxide CO-rebreathing method.

**Results:** OW/OB women presented higher absolute BV, plasma and red blood cells, and lower sFe compared to NW (P<0.05). There were no significant differences in body iron stores comparing NW, OW and OB women. Weight (r=0.74), total lean mass (r=0.82) and body fat (r=0.56) were correlated with BV (p<0.05). BV ( $r^2=0.22$ ,  $\beta=-0.29$ , P=0.02) was a negative predictor for sFe when adjusted for body iron stores. Equations utilizing combined height-weight and lean body mass were the most accurate for predicting BV in all BMI groups.

**Conclusion:** Due to the dilutional effect of BV, 'true' hypoferrremia may be overestimated in populations with a high prevalence of obesity when using sFe as an indicator.