IRON BIOAVAILABILITY FROM IRON AMINO ACID CHELATE OR FERROUS SULFATE FOR TREATMENT OF IRON DEFICIENCY ANEMIA

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Iron deficiency anemia frequently occurs in infants and young children as a result of rapid growth. Often, iron (Fe) supplementation becomes an issue due to bioavailability.

In a double blind study, 40 Fe deficient anemic infants (6 months to 3 years) were paired for age, weight, and hemoglobin (Hb). Hb ranges were 5–7, 8–9, and 10–11 g/dL. Two blood samples—one at commencement and the other at termination—were obtained from a dorsal vein in the hand of each child. All samples were assayed for Hb and serum ferritin (SF). Daily for 28 days, each child was given a syrup dose containing 5 mg Fe/kg body weight as either iron amino acid chelate (FeAAC) or ferrous sulfate (FeSO_4), plus 250 μg of folic acid with each Fe source.

Both treatments resulted in significant ($p < 0.001$) Hb increases, although the FeAAC group's increase was greater. The increase in SF was significant ($p < 0.005$) for the FeAAC group, but not for the FeSO_4 group, suggesting greater bioavailability for FeAAC. The bioavailability for each Fe source was calculated using changes in Hb and Sf, computed total blood volume (75 mg/kg body weight) and total Fe dose ingested during the 28 days. The facts that 1 g Hb contains 3.4 mg Fe, and a 1 $\mu\text{g/LSF}$ change equals 10 mg of deposited Fe were incorporated into the calculations. Thus, Fe bioavailability from FeSO_4 was calculated at 27.8%, compared to 75.0% for FeAAC. Regression analysis demonstrated that Hb changes were inversely proportional to basal Hb regardless of Fe source. The regression slopes for both Fe sources were similar, even though FeAAC bioavailability was greater.

It was concluded that FeAAC was a superior treatment for Fe deficiency anemia because this source demonstrated greater Fe bioavailability than from FeSO_4 but was equally well regulated by body Fe stores.