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Iron deficiency and associated factors in Australian children aged 4–6 years

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Iron deficiency in children impairs growth and development, regulation of emotion, and immune system function, and may lead to anaemia. The estimated prevalence of anaemia in Australian children under 5 years is 8%, with iron deficiency the most common cause.[(1)] We aimed to identify the prevalence of iron deficiency in a sample of Western Australian children and investigate factors predicting their iron status. The current study is a sub-study of The Milky Way Study (MWS).[(2)] The MWS was a randomised control trial that investigated cardiometabolic risk in children aged 4–6 years when consuming regular versus reduced fat dairy products. Data were collected at baseline and study end about family sociodemographics and child anthropometry, iron status, and dietary intake. We used these data to determine the incidence of iron deficiency and associated dietary and sociodemographic factors in this group of children. Participants were considered iron deficient if their serum ferritin was less than 20 ug/L.[(3)] All children who provided a blood sample in the MWS at baseline ($n = 35$) were included in the current study. Prevalence of iron deficiency was 28.6%. Iron-deficient participants were younger (4.9 years v. 5.5 years, $p = 0.04$) and more likely to have a mother with a high school education or lower compared to a tertiary education (75% v. 20%, $p = 0.048$). Mean daily iron intake was 7.4 ± 2.4 mg/day (recommended daily intake is 10 mg/day). Iron intake was not significantly correlated with iron deficiency. Mean daily vitamin C intake was a significant independent predictor of ferritin level, with an increase in intake of one mg per day of vitamin C associated with an increase of 0.19 μg/L of ferritin (95% CI [0.05, 0.34], $p = 0.01$). There were no associations found between iron status and socioeconomic status or child BMI. Iron deficiency appears to be associated with younger age and lower intake of vitamin C. Improved education for parents about iron deficiency and the sources of dietary iron and vitamin C may help to reduce iron deficiency in young children. Further research would benefit from larger scale studies that can evaluate other risk factors for iron deficiency, such as delayed introduction to solids and consumption of cow's milk prior to 1 year of age. As serum ferritin can be falsely inflated in the presence of hepatic steatosis (with normal inflammatory markers), future studies should also assess liver enzymes and utilise ultrasound to substantially exclude this phenomenon.

References

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