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50 Years Ago in *THE JOURNAL OF PEDIATRICS*

The Changing Landscape of Iron Deficiency Diagnosis

Hogan GR, Jones B. The relationship of koilonychia and iron deficiency in infants. *J Pediatr* 1970;77:1054-7.

Fifty years ago in *The Journal*, Drs Jones and Hogan documented the prevalence of koilonychia, a form of concave nail dystrophy, in an infant population and evaluated its association with iron deficiency. Age-matched controls were used to compare iron studies, including serum iron and hemoglobin. The authors found significantly lower than normal serum iron and hemoglobin levels in the 5% of infants with koilonychia and reported a correlation between koilonychia and iron deficiency in a pediatric population.

Our understanding of koilonychia has not changed significantly over the past 50 years, and the etiology remains poorly understood. Vasculopathy, endocrinopathies, nutritional deficiencies, and trauma may play roles.¹ In children, koilonychia is generally considered idiopathic; however, the literature suggests that nutritional deficiencies should be considered.¹ Although our understanding of koilonychia is limited, our insight into iron homeostasis and iron deficiency has expanded. According to Hogan and Jones, "serum iron concentration is the most easily available valid laboratory method for proving the depletion of iron stores." Two years after this publication, the serum ferritin assay, a critical component of our current iron deficiency workup, was developed. Although ferritin was discovered in the 1930s, a reliable assay did not become available until 1972. A low ferritin level is highly specific for iron deficiency; however, interpretation of normal or high ferritin levels can be difficult because the protein functions as an acute phase reactant. Other iron status markers, such as soluble transferrin receptor and total iron-binding capacity, are important diagnostic tools. Serum iron levels can be affected by recent dietary intake and is less reliable for diagnosis.

Iron deficiency is seen in 8%-14% of children and is associated with neurocognitive impairment. An exam finding of koilonychia would still prompt testing for iron deficiency, but our screening, diagnostic testing, and subsequent treatment of this condition has improved substantially over the decades. Because iron is a critical component of health outcomes in young children, we suspect that the breadth of knowledge will continue to evolve rapidly throughout the next 50 years.

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