Iron deficiency

Iron delivery to the developing brain is essential for energy and metabolic support needed for processes such as myelination and neuronal development.

Anemia is frequent and an independent risk factor for morbidity and mortality in patients undergoing surgery. Iron deficiency (ID) is the main cause of anemia and can be corrected by intravenous (IV) iron. Supplementation of IV iron to increase Hb concentration preoperatively may be most effective if administered at least ten days before surgery [1].

May be associated with idiopathic intracranial hypertension.

“Hair-On-End” appearance in the skull

An updated meta-analysis shows that patients with anemia appear to have a nearly 1.39-fold risk of developing overall cognitive impairment (OCI) than those without anemia. The magnitude of this risk underscores the importance of improving anemia patients' health outcomes, particularly in elderly patients [2].

Iron deficiency, especially in the developing brain, can result in a number of long-term neurological deficits that persist into adulthood. There is considerable debate that excess access to iron during development may result in iron overload in the brain and subsequently predispose individuals to age-related neurodegenerative diseases. There is a significant gap in knowledge regarding how the brain acquires iron during development and how biological variables such as development, genetics and sex impact brain iron status.

In a study, Chiou et al. used a mouse model expressing a mutant form of the iron homeostatic regulator protein HFE, (Hfe H63D), the most common gene variant in Caucasians, to determine impact of the mutation on brain iron uptake. Iron uptake was assessed by using 59 Fe bound to either transferrin or H-ferritin as the iron carrier proteins. We demonstrate that at postnatal day 22, mutant mice brains take up greater amounts of iron compared to wildtype. Moreover, we introduce H-ferritin as a key protein in brain iron transport during development and identify a sex and genotype effect demonstrating female mutant mice take up more iron by transferrin while male mutant mice take up more iron from H-ferritin at PND22. Furthermore, we begin to elucidate the mechanism for uptake using immunohistochemistry to profile the regional distribution and temporal expression of transferrin receptor and Tim-2, the latter is the receptor for H-ferritin. These data demonstrate that sex and genotype have significant effects on iron uptake and that regional receptor expression may play a large role in the uptake patterns during development [3].

Case reports

A 2-year-old girl presenting with non-specific symptoms, who was found to be iron-deficient and anaemic, in the context of excessive cow's milk consumption. We explore the patient's diagnostic journey, including a neurological deterioration and the link between her iron deficiency and the final diagnosis. [4].

A young Chinese woman with untreated iron deficiency anemia presented with fatigue and pain in her thigh muscles for 3 days and tea-colored urine for 1 day, after cycling and subsequently receiving percussion gun treatment by her coach for the purpose of massage and relaxing tired muscles. Muscle tenderness and multiple hematomas were found on her thighs, and her urinalysis indicated hemoglobinuria. Her serum creatine kinase was reported as “undetectably high,” a hallmark of serious muscle damage leading to a diagnosis of severe rhabdomyolysis. Aggressive intravenous fluid resuscitation, urine alkalinization via intravenous alkaline solution, assessment of urine output, and maintenance of electrolyte balance were administered during hospitalization.

Results: The patient's clinical presentation gradually improved with the decline of creatine kinase, and she recovered well during follow-up.

Conclusion: A case of severe rhabdomyolysis after percussion massage should alert caregivers, sports professionals, and the public to suspect and recognize the potentially serious adverse effects of percussion guns and to ensure that percussion massage guns be used appropriately and safely in rehabilitation therapy, especially in individuals with an underlying disease or condition. Research is needed to examine the benefits, indications, contraindications, and adverse reactions of percussion guns [5)].

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