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# Iron: a Notable Risk Factor for Disease

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During the past sixty years, many hundreds of studies have reported that excessive/misplaced iron enhances disease frequency and severity. Classes of diseases intensified by iron include endocrinological, gastrointestinal, infectious, neurodegenerative, oncologic, ophthalmic, orthopedic, pulmonary and vascular [1,2]. Two distinct mechanisms of ferrotoxicity have been described. In one, excessive iron serves as an essential nutrient for most bacterial, all fungal and all protozoan infections as well as for all cancer cells [3,4]. Iron loading also promotes host synthesis of viral pathogens [3].

In the other mechanism of ferrotoxicity, specific cells have been discovered to be remarkably sensitive to the lethal oxidative potency of iron. Examples include pancreatic beta cells that produce insulin [5], osteoblasts that rebuild bone [6] and anterior pituitary cells that function in stimulation of endocrine glands [7]. These cells are killed by iron concentrations that are several orders of magnitude lower than, e.g., macrophages, hepatocytes, and pancreatic exocrine cells.

We can look forward to further discoveries of key cells that are unusually sensitive to the lethal action of iron. For instance, numerous neurodegenerative diseases have been reported to develop excessive accumulation of iron in specific neuro-anatomic sites and/or to be exacerbated by iron [1,2]. We can predict that specific neural cells will be discovered to be unusually sensitive to iron. Hopefully, it might be possible to replace these cells. Meanwhile, it is essential that we employ well established methods to treat and prevent iron loading [1].

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