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New developments and controversies in iron metabolism and iron chelation therapy

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Abstract

Iron is essential for all organisms including microbial, cancer and human cells. More than a quarter of the human population is affected by abnormalities of iron metabolism, mainly from iron deficiency and iron overload. Iron also plays an important role in free radical pathology and oxidative damage which is observed in almost all major diseases, cancer and ageing. New developments include the complete treatment of iron overload and reduction of morbidity and mortality in thalassaemia using deferiprone and deferiprone/deferroxamine combination and also the use of the maltol iron complex in the treatment of iron deficiency anaemia. There is also a prospect of using deferiprone as a universal antioxidant in non iron overloaded diseases such as neurodegenerative, cardiovascular, renal, infectious diseases and cancer. New regulatory molecules of iron metabolism such as endogenous and dietary chelating molecules, hepcidin, mitochondrial ferritin and their role in health and disease is under evaluation. Similarly, new mechanisms of iron deposition, removal, distribution and toxicity have been identified using new techniques such as MRI increasing our understanding of iron metabolic processes and the targeted treatment of

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