



Deferiprone Reverses Iron-Induced Dysregulation of Hepatic Iron Homeostasis Genes

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Keywords: Oxidative stress, Iron chelation therapy, Reactive oxygen species, Ferritin regulation, Bone morphogenetic protein (BMP)/Smad pathway, Transferrin metabolism.

Abstract: Iron overload leads to progressive organ dysfunction, with the liver serving as the primary site of deposition due to the absence of a physiological elimination pathway. The regulation of systemic iron homeostasis depends on proteins such as hepcidin (*Hamp*), ferritin light chain (*Ftl*), and transferrin receptor 1 (*Tfr1*). This study evaluated hepatic expression of *Hamp*, *Ftl*, and *Tfr1* in normal rats and assessed the effect of Deferiprone (DFP) in an iron overload model. Eighteen male Wistar rats (150–200 g) were randomized into three groups ($n = 6$ each): normal (N), iron overload (NC; iron dextran 120 mg/kg body weight, intravenously, over 15 days), and treatment (T; iron dextran + DFP 100 mg/kg body weight/day orally for 28 days). Gene expression was analyzed by RT-PCR and quantified using the Livak method. Iron overload significantly upregulated *Hamp* and *Ftl* while downregulating *Tfr1* compared with controls. DFP administration reversed these effects, reducing *Hamp* and *Ftl* expression while restoring *Tfr1* to near-normal levels. These findings suggest that DFP modulates hepatic iron-regulatory genes, supporting its therapeutic potential in managing iron overload.

Declarations

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Conflict of Interest

The authors declare no conflicting interest.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics Statement

This research received ethical approval from the Animal Research Ethics Committee of Universitas Padjadjaran, Bandung, under approval number 75/UN6.KEP/EC/2023. All procedures involving experimental animals were conducted in strict accordance with the ethical guidelines established by Universitas Padjadjaran, based on internationally accepted principles for the humane treatment of animals.

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