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Pathophysiology of iron overload and potential benefit from iron chelation in low-risk myelodysplastic syndrome

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Myelodysplastic syndromes (MDS) are a group of heterogeneous clonal bone marrow disorders characterized by ineffective hematopoiesis, peripheral blood cytopenias, and potential for malignant transformation. Lower/intermediate risk MDS are associated with longer survival and high RBC transfusion requirements resulting in secondary iron overload. Recent data suggest that markers of iron overload portend a relatively poor prognosis and retrospective analysis demonstrates that iron chelation therapy is associated with prolonged survival in transfusion-dependent MDS patients. New data provides concrete evidence of iron's adverse effects on erythroid precursors *in vitro* and *in vivo*. Renewed interest in the iron field was heralded by the discovery of hepcidin, the main serum peptide hormone negative regulator of body iron. Evidence from β-thalassemia suggests that regulation of hepcidin by erythropoiesis dominates regulation by iron. Since iron overload develops in some MDS patients who do not require RBC transfusions, the suppressive effect of ineffective erythropoiesis on hepcidin may also play a role in iron overload. We anticipate that additional novel tools for measuring iron overload and a molecular mechanism-driven description of MDS subtypes will provide a deeper understanding of how iron metabolism and erythropoiesis intersect in MDS and improve clinical management of this patient population.

Biography

Niraj Shenoy is the youngest Internal Medicine Chief Resident at the Albert Einstein College of Medicine. His research interests include epigenetics in cancer, cancer pathways, myelodysplastic syndromes and ribosomal protein alterations in hematologic syndromes and cancer. He has published in leading hematology and oncology journals and has been an invited speaker at various international conferences. He is an Editorial Board Member of Frontiers in Oncology and Journal of Tumor. He has been inducted into the Leo. M. Davidoff Society of the Albert Einstein College of Medicine for outstanding achievement in the teaching of medical students and residents.

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