Pharmacological Management of Anemia in Chronic Kidney Disease

English Abstract

Anemia is a common and clinically significant complication of chronic kidney disease (CKD), contributing to fatigue, reduced exercise tolerance, impaired quality of life, and elevated cardiovascular risk. This lecture provides a concise overview of key mechanisms underlying CKD-related anemia, including inadequate erythropoietin (EPO) production, inflammation-mediated increases in hepcidin causing functional iron deficiency, shortened red blood cell lifespan, and dialysis-associated blood loss.

Diagnostic evaluation focuses on identifying reversible etiologies and assessing iron status, inflammation, and nutritional factors.

Pharmacologic management emphasizes iron optimization and erythropoiesis-stimulating agents (ESAs) as first-line therapy, supported by extensive evidence regarding safety and efficacy. Hypoxia-inducible factor prolyl hydroxylase inhibitors (HIF-PHIs) provide an oral alternative for selected patients with ESA hyporesponsiveness or those who prefer oral agents, though careful cardiovascular risk assessment remains essential.

The updated KDIGO 2025 recommendations highlight individualized decision-making and evidence-based, safety-oriented anemia management.

中文摘要

慢性腎臟病（CKD）相關貧血是臨床上常見且具重大影響的併發症之一，與疲倦、運動耐受度下降、認知功能受損、生活品質下降及心血管事件風險上升密切相關。本講座概述 CKD 貧血的核心病理機轉，包括腎臟促紅血球生成素（EPO）分泌不足、慢性發炎導致鐵調素（hepcidin）升高所造成的功能性缺鐵、紅血球壽命縮短，以及透析相關失血。診斷重點著重於找出可逆原因，例如營養缺乏、慢性發炎及鐵不足，並透過血液檢查、鐵代謝指標與營養評估進行全面判斷。

治療策略以鐵補充與促紅血球生成劑（ESA）為第一線，因其具備充分且長期的療效與安全性證據；HIF-PHI 則可透過提升內源性 EPO 及改善鐵利用效率，為特定患者提供口服替代選項，但仍需注意心血管風險。

最新 KDIGO 2025 指引亦強調個別化治療與嚴謹的安全監測。