

Red cell storage lesion and potential effects on the microvasculature

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The metabolic, biochemical and molecular changes to erythrocytes during storage in preservative medium is collectively referred to as the “red cell storage lesion”. Many of the changes have been known for decades and have influenced how storage media have developed. More recently, changes relating to nitric oxide have been recognized as an important factor that may potentially affect the ability of stored erythrocytes to deliver oxygen. In addition, changes to endothelial cells, release of free hemoglobin, free iron and microparticles have gained interest in the blood bank literature and their relationship to oxygen delivery. Septic patients are particularly at risk for end-organ damage and multi-organ failure. Some propose that transfusion of red blood cells, particularly older red blood cells, may potentially decrease the ability of transfused stored red blood cells to deliver oxygen to the microvasculature. This data may be supportive of the concept of Transfusion-Related Immunomodulation (TRIM).

This discussion will include an overview of red blood cell storage solutions, history and literature relating to TRIM, and review of the red cell storage lesion with emphasis on recent literature and potential effects on the recipient microvasculature.

Biography

Christopher T. Clark received his MD degree from East Carolina University School of Medicine in 1991. He completed his residency training in combined Clinical and Anatomic Pathology at Mount Sinai Medical Center, Cleveland, followed by fellowship training in Cytopathology/Surgical Pathology at Case Western Reserve University, Cleveland. He is currently an Assistant Professor at the University of Tennessee Graduate School of Medicine and is a staff pathologist and Blood Bank Medical Director at the University of Tennessee Medical Center, Knoxville.

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