Understanding how oxidative stress impairs endothelial progenitor cell function

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Although its been over a decade since endothelial progenitor cells or EPCs, cells that circulate in the blood repairing and replacing the cells that line blood vessels, were identified, the field is still evolving. EPCs are now being studied as biomarkers to assess the risk of future cardiovascular disease and as potential agents for vascular regeneration.

Researchers from the Herman B Wells Center for Pediatric Research at the Indiana University School of Medicine and Riley Hospital for Children report in the November 2008 issue of the journal *Antioxidants & Redox Signaling* that a review of the scientific literature reveals that how EPCs respond to oxidantive stress appears to be a critical determinant in maintaining a healthy cardiovascular system.

A comprehensive understanding of how oxidantive stress, the biochemical modification of cells, impairs EPC function may lead to antioxidant therapy to prevent disease.

"The study of EPCs is exciting because as the work evolves it should enable us to develop clinical strategies to decrease the risk of heart attack or stroke by reversing oxidative stress at the cellular level," said study author Laura Haneline, M.D., associate professor of pediatrics at the IU School of Medicine. "These strategies will need to be applied early in the disease when preventing oxidative damage is a possibility because once the damage has occurred it may not be reversible."

High cholesterol causes increased oxidative stress, impairing the

function of EPCs. In addition to being implicated in cardiovascular diseases, oxidative stress is also a factor in diabetes.

"Further studies of how oxidative stress impairs the function of EPCs are critical. Eventually you should be able to get a simple blood test measuring your EPCs to see if you are at risk for disease. With this knowledge, in the not too distant future, we should be able to apply antioxidant therapies to prevent that disease," said Dr. Haneline.

In the meantime studies that examine the impact of oxidative stress on specific functions of the EPCs are needed to fully understand the progression of vascular disease.

Source: Indiana University