

Endothelial Progenitor Cell in Coronary Artery Disease

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The maintenance of endothelial integrity is essential for the preservation of a healthy vasculature. The ability to maintaining of a functioning healthy endothelium may have profound beneficial effect on vascular repair and positive impact on prognosis in patients with coronary artery disease (CAD).

Endothelial repair is dependent on undifferentiated cells migrating to sites of vascular injury. Endothelial progenitor cells (EPCs) are a population of cells with the capacity to circulate, proliferate, and differentiate into mature endothelial cells at injury site. EPCs derived from bone marrow circulate in the peripheral blood and have been implicated in neoangiogenesis after tissue ischemia has occurred. Circulating EPCs were first identified in a preclinical model of AMI and the trafficking of EPC has been extensively studied for tissue repair in cases of AMI, stroke, and hind limb ischemia. EPCs perpetuate this cycle by secreting pro-angiogenic cytokines. EPCs are capable of proliferating and differentiating into endothelial cells and are therefore regarded as ideal candidates for vascular regeneration. Additionally, it has been demonstrated that patients at risk for CAD evidence reduced numbers of circulating EPCs with impaired activity. Reports have suggested that circulating levels of EPCs are significantly lower in patients with angiographic CAD progression, and that statin treatment in patients with stable CAD induces the augmentation of circulating EPCs with enhanced functional activity. And then, EPC has also been used as a predictor of disease severity and positive prognosis in various ischemic vascular diseases.

The following lecture discusses issues surrounding EPC identification, role in vascular repair, factors affecting EPC numbers, the role of clinical outcome in patients with coronary artery disease.