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## Colony forming units-endothelial progenitor cells: A surrogate marker for diabetic retinopathy and high cardiovascular mortality rate

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Diabetic retinopathy is a risk factor for increased cardiovascular death. Our purpose was to find a significant difference in levels of endothelial progenitor cells (EPCs) in the peripheral blood of patients at different stages of diabetic retinopathy. In this prospective study, colony forming units of endothelial progenitor cells (CFU-EPCs) in peripheral blood were counted. Forty subjects were enrolled (10 healthy [41±8 y], 10 type 2 diabetes mellitus (T2DM) [64±12 y] without retinopathy, 10 T2DM patients [62±26 y] with non-proliferative retinopathy (NPDR), 10 T2DM patients [66±9 y] with proliferative retinopathy (PDR)). The study was approved by the ethics committee of the hospital and every subject signed a consent form before enrollment. Growing CFU-EPCs was according to the Hill's EPCs protocol. Blood was drawn early in the morning and was processed within one hour. Mononuclear cells were separated and cultured on fibronectin-coated plates with EndoCult medium (Stemcell Technologies, Vancouver, Canada) for 5 days. CFU-EPCs were counted on day 5 (an average of 8 wells). It was observed that healthy subjects had 36±8 CFU-EPCs, patients without retinopathy had 13±12 CFU-EPCs ( $p<0.01$ ), patients with NPDR had 22±26 CFU-EPCs ( $p=NS$ ), and 2±2 CFU-EPCs in patients with PDR ( $p<0.01$ ). A significant difference was found between patients with PDR and with NPDR ( $p<0.05$ ). It was also observed that, CFU-EPCs were inhibited in T2DM patients with DPR. Levels of CFU-EPCs can be used as a surrogate biologic marker to determine the severity of diabetic retinopathy and for cumulative vascular risk.

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