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만성 신부전에서 중배엽 줄기 세포의 역할

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The Role of Mesenchymal Stem Cell in Chronic Renal failure

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Introduction : The most commonly used therapeutic targets in nephrology are the reduction of injury, delay of progression, or renal replacement therapy. Many animal and human studies demonstrated the role of stem cells in repair and regenerations of kidney. Mesenchymal stem cell (MSC) have shown to improve outcome of acute renal injury models. It is controversial whether MSC can reduce injury following a toxic/ ischemic event and delay renal failure in chronic kidney disease. We evaluated the hypothesis that the treatment with MSC could improve renal function and attenuate injury in chronic renal failure.

Materials and methods : Sprague-Dawley female rats (8 weeks old, 182.2±7.2g) were performed with right nephrectomy. The left renal artery and vein were clamped for 40 minutes and then released to allow perfusion followed by left half nephrectomy. We injected MSC (1×106 cells) by tail vein 1 day after nephrectomy. Renal function including blood tests and 24 hours urine collection was evaluated at 2, 4, 7 days and every month until 6 months. Histologic evaluation was assessed by glomerular sclerosis and interstitial findings which include inflammation, fibrosis and tubular atrophy.

Results : Blood urea and creatinine level were not affected by MSC injection. However, the weight gain and creatinine clearance in the MSC injected group were greater as compared to the control group. Proteinuria in the MSC injected group were less at 6 months (285.4±304.6 vs 1928.0±1108.3, $p<0.05$). Histologic findings were not different between control and MSC injected group.

Conclusion : The results suggest that MSC injection improve renal function and proteinuria, but does not prevent progression of chronic kidney disease.