

Stem cell transplants help kidney damage

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Transplanting autologous renal progenitor cells (RPCs), (kidney stem cells derived from self-donors), into rat models with kidney damage from pyelonephritis - a type of urinary infection that has reached the kidney - has been found to improve kidney structure and function.

The study, authored by a research team from the Tehran University of Medical Sciences, is published in the current issue of *Cell Medicine*.

"Advancements in stem cell therapies and [tissue engineering](#) hold great promise for regenerative nephrology," said Dr. Abdol-Mohammad Kajbafzadeh, corresponding author. "Our RPC transplant study demonstrated benefits for pyelonephritis, a disease characterized by severe inflammation, renal function impairment and eventual scarring, and which remains a major cause of end-stage-renal disease worldwide."

The researchers divided 27 rats into three groups, two of which were modeled with an induced pyelonephritis in their right kidneys, while the third group did not have induced disease. RPCs were obtained from the diseased animals' left kidneys and injected into the right kidney six weeks later. Two weeks after injection, tubular atrophy was reduced. After four weeks, fibrosis was reduced and after sixty days, right renal tissue integrity was "significantly improved."

"We propose that kidney augmentation was mainly due to functional tissue regeneration following cellular transplantation," said Dr. Kajbafzadeh. "Kidney-specific stem/[progenitor cells](#) might be the most appropriate candidates for transplantation because of their inherent

organ-specific differentiation and their capacity to modulate tissue remodeling in chronic nephropathies."

The researchers concluded that because renal fibrosis is a common and ultimate pathway leading to end-stage [renal disease](#), amelioration of fibrosis might be of major clinical relevance.

"Transplanting RPCs showed the potential for partial augmentation of kidney structure and function in pyelonephritis," said Dr. Kajbafzadeh. "This is one of the first studies to demonstrate improved renal function after cell transplantation. The translation of this study into larger clinical models will be very relevant to validate the success of this small animal study." said Dr. Amit Patel, Section Editor Cell Medicine, Associate Professor of Surgery, University of Utah.

More information: Kajbafzadeh, A-M.; Elmi, A.; Talab, S. S.; Sadeghi, Z.; Emami, H.; Sotoudeh, M. Autografting of Renal Progenitor Cells Ameliorates Kidney Damage in Experimental Model of Pyelonephritis. *Cell Med.* 1(3): 115-122; 2010.

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