

In Cadaver kidney Recipients, Autologous Bone Marrow Stem Cell Transplantation Significantly Improve Graft Function, Short-term Outcome

*Daryoush Hamidi Alamdari¹, Farzaneh Sharifipour², Hassan Ravari³, Fereshteh Mamdouhi², Massih Naghibi², Maryam Hami², Abbasali Zeraati², Fatemeh Nazemian², Reza Mahdavi², Mahmood Tavakoli², Ebrahim Khaleghi²

¹Stem Cell and Regenerative Medicine Research Group, Department of Biochemistry, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

²Transplant Department, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

³Mashhad Vascular and Endovascular Surgery Research Center, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.

Background:

Renal transplantation is the best choose in the end stage renal disease (ESRD), and acute rejection and graft dysfunction remain major challenges in the worldwide, even with the advent of new immunosuppressive drugs. The novel cell-based anti-rejection treatments have been studied by using different stem cell sources. In this study, transplantation of autologous-bone-marrow-derived-total-nucleated-cells is used to improve the cadaver kidney graft function.

Methods:

18 ESRD patients, which candidate for cadaver kidney transplantation, were divided in two groups (group A and B) and there was no significant difference (male, female, age, weight, type of dialysis) between two groups. The two kidney of one cadaver were transplanted to two recipients. Before transplantation, randomly, autologous-bone-marrow aspiration was done for one recipient, and then the transplantation was done for both of recipients. The total-nucleated-cells were separated and infused intravenously during and after the transplantation, respectively. In post transplantation, 6 hours diuresis, delay graft function (DGF), creatinine (1 week, 2 weeks and 3 months), cyclosporine (2 weeks) and cold ischemia were measured in bone-marrow-treated group (A: 9 patients) and non-bone-marrow-treated group (B: 9 patients).

Results:

A significant increase in diuresis, a significant decrease in DGF, a significant decrease (1 week and 2 weeks) and marginally significant decrease (3 month) in creatinine, no significant difference in cyclosporine blood level (2 weeks), operation time and cold ischemia were seen in group A in comparison to group B. 2 patients had CMV infection in group B, but none in group A.

Conclusion:

The transplantation of autologous-bone-marrow-cells in cadaver kidney recipient is safe and significantly decreases early graft dysfunction. Further clinical trial is needed to confirm these promising results.

Keywords: Bone marrow, Delayed graft function, Kidney transplantation, Stem cell.

Oral Presentation

***Corresponding Author:** Daryoush Hamidi Alamdari, Stem Cell and Regenerative Medicine Research Group, Department of Biochemistry, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.