

Impact of Standard Preservation on Renal Transplantation Outcome

IJKD 2019;13:281
www.ijkd.org

Dear Editor,

Renal transplantation from heart-beating deceased donors has entered to the 20th year of activity in Iran. The rate has been literally escalated over these years; however, the outcome in a wide scale has not yet been methodologically studied, to the best of my knowledge.

Currently, over 50% of kidney transplantation is performed from deceased donors in Iran;¹ nonetheless, some ideas in point of quality view and outcome perspective are still missing in this context.

Undisputedly, the outcome of solid organ transplantation is strikingly dependent on the quality of the retrieved organ. Brain death, by itself, is accompanied with several neuro-hormonal, hemodynamic and inflammatory disturbances which they have negative impact on organ viability. Moreover, hypothermia, ischemia, and reperfusion injuries at the time of recovery, transportation and implantation pose the organ to the more deteriorating conditions.

Concurrently, it is widely established that failed renal transplant causes increased risk of morbidity and mortality in recipients compared to dialysis patients with no history of transplantation, so and additionally, to transplant a poorly preserved kidney allograft gives no survival benefit and causes greater level of sensitization.²⁻⁴

Hypothermia, during recovery and transportation, without using standard preservation solution causes cellular edema and cell lyses through suppression of Na/K ATPase pump. Ischemia leads to intracellular acidosis via stimulation of glycolysis and glycogenolysis which in turn causes intracellular calcium overload and inflammation responses due mainly to activation of lysosomal enzymes, alter mitochondrial properties and cytokine production as a consequence. To use iso/low osmotic pressure crystalloids for cold storage, as it is routinely done in case of kidney retrieval from deceased donors in Iran, causes interstitial edema and collapse

capillary network and eventually reperfusion injuries. Meanwhile, oxygen-free radicals formed by xanthine-oxidase causes non-specific oxidation of cell structures mostly membrane lipids and ends to cell lysis. Preservation solutions with osmolarity ≥ 310 , scavengers, antioxidants, energy precursor, impermeants, electrolyte composition similar to the intracellular compartment, buffers, and anti-inflammatory agents prevent all destructive before-mentioned processes and regulates the contributors with negative influence on nephron mass.⁵

Accordingly, in a setting where sensitive tissue compatibility testing has been so far de-emphasized,⁶ to raise a concern on outcome-oriented strategies by concentrating on modifiable factors such as standard organ preservation can make renal transplant program more beneficial and cost-effective procedure.

Alireza Heidary Rouchi

Iranian Tissue Bank and Research Center, Tehran University of Medical Sciences, Tehran, Iran
E-mail: rouchiah@sina.tums.ac.ir

REFERENCES

1. International Registry in Organ Donation and Transplantation. Available from: www.irodat.org
2. Fernandez Fresnedo G, Ruiz JC, Gomez Alamillo C, de Francisco AL, Arias M. Survival after dialysis initiation: a comparison of transplant patients after graft loss versus nontransplant patients. *Transplant Proc.* 2008 Nov; 40(9): 2889-2890.
3. Rouchi AH, Mahdavi-Mazdeh M. Where is transplantation with a "Marginal Kidney" justifiable? *Ann Transplant.* 2016 Jul 26; 21: 463-468.
4. Foster BJ, Dahhou M, Zhang X, Platt RW, Hanley JA. Change in mortality risk over time in young kidney transplant recipients. *Am J Transplant* 2011; 11: 2432-2442.
5. Ambros JT, Grinyo Boira JM. Organ preservation solutions and techniques. In: Manyalich M (ed). University of Barcelona, 2007, Spain
6. Opelz G, Dohler B. Effect of human leukocyte antigen compatibility on kidney graft survival: comparative analysis of two decades. *Transplantation.* 2007 Jul 27; 84(2): 137-143.