Deceased Donor Renal Transplantation Programme in The Context of Nepal

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ABSTRACT

INTRODUCTION: Renal Transplantation is the most effective treatment for End Stage Renal Disease (ESRD) and offers great promise in reducing mortality and morbidity associated with chronic kidney ailments. It substantially improves the quality of life of patients when compared to other conventional therapies, including maintenance dialysis therapy. There is a great shortage of organs available for transplantations and waiting list of recipients and number of waiting lists deaths appears to be ever increasing worldwide. One strategy to counter this shortage is to use organs from deceased donors. This article postulates on the use of deceased donors for transplantation in Nepal as an effective strategy to support Nepal’s transplantation programs and also reduce morbidity and mortality due to renal illness in Nepal.

KEY WORDS: Brain stem, morbidity, deceased donors, renal, mortality, transplantation, Nepal, program.

INTRODUCTION

Renal transplantations can be classified as deceased-donor (formerly known as cadaveric) or living-donor transplantation depending on the source of the donor organ. Living-donor renal transplants are further characterized as genetically related (living-related) or non-related (living-unrelated) transplants, depending on whether a biological relationship exists between the donor and recipient. Organ procurement for transplantation was pioneered by Soviet surgeon, Yu Yu Voronoy, who attempted the first kidney transplant on April 3rd, 1933. The donor was a sixty year old man who died on admission to the hospital from a traumatic brain injury. His kidney was removed six hours postmortem and transplanted into the thigh of a twenty six year old woman who later succumbed to acute renal failure and died as a result of Mercury poisoning. However, it is interesting to note that the allograft produced several milliliters of urine post operatively before the patient died a few days post transplantation.1

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There is also considerable literature documenting that kidney transplantations were performed as early as the 1950s and 1960s. The first deceased donor (cadaveric) renal transplantation in the United States was performed June 17, 1950, on Ruth Tucker, a 44-year-old woman with polycystic kidney disease, at Little Company of Mary Hospital in Evergreen Park, Illinois. Although, the donated kidney was rejected ten months later as there was no immunosuppressive therapy available at the time, Ruth went on to live for an additional five years.2 The first kidney transplants between living patients were undertaken in 1954 in Boston and Paris. The Boston transplantation, performed on December 23, 1954, at Brigham Hospital was performed by Dr. Joseph Murray and colleagues on identical twins to eliminate any problems of an immune reaction. For his contributions to advancing medicine, Dr. Murray received the Nobel Prize in Medicine in 1990. The recipient died eight years after the transplantation.3

The first kidney transplantation in the United Kingdom did not occur until 1960, when Michael Woodruff performed one between identical twins in Edinburgh.4 In 1966, a Frenchman called Guy Alexandre described brain death and the concept of removal of kidneys from a “beating-heart” deceased donor and potential for its subsequent transplantation.4 In India, Dr. Mohan Rao performed the first live related renal transplant at...
CMC, Vellore in 1971 and in 1994, Dr. Sandeep Guleria performed the first renal transplant from a deceased donor. In Pakistan, first renal transplantation was done in 1985 and first deceased donor transplantation was done in 1995. Kidney transplantation is now a well established practice as the most effective way of treating patients with an end – stage renal diseases (ESRD). 5

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Counseling of the patients and their family remains one of the most important and sensitive issues for the success of any organ donation program. The entire transplant team led by the transplant coordinator, surgeons, nurses and medical officers and other clinical units caring for the patient play a key role in this. Compassionate, ethical and sensitive treatment of a donor’s family including attention to psychological needs and grief counseling offer important benefits for the family coping with the death.

The prospective deceased organ donor is a person who fulfills the definition for imminent brain (stem) death, i.e., deeply comatose patient mechanically ventilated in an ICU with irreversible catastrophic brain damage of known origin. It is essential to exclude any confounding factors for the loss of consciousness. Those factors are primary hypothermia, CNS depressant drugs, severe circulatory, endocrine or metabolic disturbances before assessing brain stem damage. There must be absence of all brain stem responses such as pupillary response to light, corneal reflex, vestibuloocular reflexes, gag reflex, and a positive apnea test. It is customary to repeat the test depending on the primary pathology and the clinical course of the disease.

In 2001, the United Network for Organ Sharing (UNOS) developed the category of expanded criteria donors (ECDs) as potential new sources for deceased donor kidney transplantation. ECD has been codified to be deceased donors aged 60 years or older and those aged 50 to 59 years with at least 2 of the following conditions: history of hypertension, serum creatinine level greater than 1.5 mg/dL (132.6µmol/L), and cerebrovascular cause of death. The decision to use an ECD kidney is complex because there are data to suggest that these kidneys have a these allografts have a higher rate of delayed graft function, more acute rejection episodes, and decreased long-term graft function. But recently, Ojo et al has demonstrated that the recipients of expanded kidneys receive the benefit of extra life years when compared to wait listed dialysis patients.

The evaluation of a deceased donor begins when brain death is declared and the donor’s family gives consent for organ donation. Blood tests are done to determine if the kidneys are functioning normally. Blood typing and tissue typing are also completed. The donor is tested for hepatitis, HIV and other viruses.

Adequate volume resuscitation is critically important to ensure donor viability, as systemic hypotension is common in brain dead individuals secondary to lack of sympathetic tone, hypervolemia, diabetes insipidus and adrenal insufficiency. It is also helpful to keep in mind that certain endocrine problems such as inadequate Anti diuretic hormone production, adrenal insufficiency, and thyroid abnormalities may also occur in these deceased donors. In order to deal with these, administration of triple therapy with desmopressin and vasopressin, methylprednisolone and a single dose of triidothyronine or L- thyroxine has been advocated.

The transplant procedure 6-8, 17, 18

Once a compatible organ has been identified and obtained, the retrieval surgery is performed in the operating room under semi emergency basis with the maintenance of all full aseptic precautions.

Out of the numerous approaches to Kidney transplantation, the Gibson approach is commonly used. It involves an incision in a lower quadrant of the abdomen, with division of the muscles of the abdominal wall and dissection of the retroperitoneal space to expose the iliac vessels and the bladder. The external iliac artery and vein are the preferred targets to which the renal artery and renal vein are connected. The inferior vena cava and aorta are accessible via the right-sided approach. In most cases existing kidneys are not removed, as this has been shown to increase the rates of surgical morbidities. Therefore the kidney is usually placed in a location different from the original kidney, often in the iliac fossa.

One of the most important aspects of deceased donor program is organ preservation and packing till it reaches safely to its final destination and is transplanted. If transplantation is to be done immediately the kidneys are perfused with chilled Ringer’s Lactate and if the transplantation being done is delayed then each...
kidney after retrieval is perfused with the preservative solution till the kidney is totally blanched and the returning fluid is clear. The kidney is then immersed in the same solution and kept in a sealed plastic bag, which is again immersed in a sterile bag containing sterile Ringer’s Lactate and stored in a sterile flask. The harvests then can be stored or transferred to the required center.

**The Nepalese Context:**

It is estimated that 2.7 million people are suffering from the kidney related ailments in Nepal with two thousand and seven hundred cases being added to this list annually. The demand for transplantations is estimated to be 750 per year which means at least two transplantation surgeries need to be performed daily. Surgery for Kidney transplantations made a late entry in the arena of medical sciences in Nepal mainly due to the absence of a legislative and policy frameworks surrounding organ donations and transplantations. The first successful kidney transplantation was performed at Tribhuvan University Teaching Hospital (Institute of Medicine) on 8th August 2008. This program was then expanded to the National Academy of Medical Sciences (Bir Hospital) which started these services on 12 December 2008. However, in real terms, both these institutions only perform less than 10 transplantations every month and have so far conducted only 110 transplantations. Despite many of the challenges prevalent in developing countries, and challenges intrinsic to Nepal, these pioneering programs have demonstrated considerable success in the treatment of chronic renal ailments. The current legislative framework for Organ Donation and Transplantation in Nepal allows only “live related” human organ donors who are in direct relation to the recipient and that too from the paternal side only. In order to expand the program, provide lifesaving transplantation services, decrease the number of people waiting for transplantations, reduce mortality and morbidity from ESRD, the current policy and legislative framework needs to be expanded and strengthened.

Deceased donor transplantation is an effective strategy to counter the shortage of organs, legislative and policy frameworks must also allow live human organ donors from the maternal side as well as from other well-wishers, friends and non-relatives who may wish to donate organs. A robust monitoring system needs to be institutionalized across the medical, law enforcement and administrative agencies so that illegal and unethical acts such as organ trafficking and selling organs for financial gain be kept under strict vigilance.

The Government should prioritize such pioneering programs, amend the policy and legislative framework to support further expansion of the program because these programs have a potential to:

1. Significantly reduce Mortality and Morbidity from Renal Diseases.
2. Are Cost effective strategy: treatment at home, saves travel costs
3. Will help develop infrastructure and train skilled human resource
4. Provide excellent tertiary care services to clients
5. Expand choice of treatment at home and educate the client.
6. Institutionalize strong legal and policy framework to combat illegal trafficking of organs
7. Pioneer: Nepal can play a leadership role in organ transplantation in South Asia

**CONCLUSION**

Organs are a precious resource and since modern medicial science has advanced techniques to save them. These should be applied to help people lead a healthy and a productive life. Families of the deceased who decide to donate often find that it helps through the grieving process. They receive great comfort in being able to have something positive come from the death of a loved one. For recipients, organ transplant offers a second chance at life.

As number of patients suffering from end stage organ failure is increasing, it has created a disparity in quantity of donors and recipients. The current policy and legislative framework on organ donation and transplantation in Nepal needs to be expanded and strengthened to decrease the number of patients waiting for transplant and reduce morbidity and mortality from ESRD. A shorter wait means a longer life for kidney transplant recipients. Expansion of the donor pool to deceased donor as well as live human organ donors from the maternal side as well as from
other well-wishers, friends and non-relatives who may wish to donate organs could be an effective strategy to counter the disparity. Utmost importance should also be given to strict monitoring of illicit acts such as organ trafficking and selling for financial gain.

REFERENCES

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