

Preparing for a Kidney Transplant: What do nephrology nurses need to know?

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Aim

The aim of this educational supplement is to provide the nephrology nurse with an overview of kidney transplantation so they can support their clients who are currently undergoing preparation for kidney transplantation.

Learning outcomes

- To identify those clients in your unit who are on the transplant list or are being worked up.
- To understand the preparation required for a patient to go onto the transplant list.
- To know the role of the nephrology nurse in supporting patients on the transplant list.

Over the past 40 years in Australia the availability of treatment options for patients with end stage renal disease (ESRD) have expanded and developed. Whilst renal replacement therapies such as haemodialysis (HD) and peritoneal dialysis (PD) now provide patients with improved survival and quality of life, it is transplantation that offers the patient hope of freedom from a life of fluid and food restrictions, regular treatments via a machine or PD and the opportunity to get back to work (Franklin, 2002).

In Australia in 2007 there were 16,027 patients currently receiving renal replacement therapies. 6,845 patients had functioning kidney transplants and 15% of the remainder 9,182 patients were on kidney transplant lists (ANZDATA, 2007). Therefore the dialysis

nurse is placed in the ideal position to help enable and prepare renal patients for transplantation.

Sources of kidney transplant donors

Kidney transplantation, whilst not a cure, is the treatment of choice for people suffering ESRD. In Australia a variety of donor sources are utilized to help meet the increasing demand for organs for transplantation. Deceased donors may be either beating heart or non beating heart donors. Beating heart donors have suffered brain stem death and are maintained on a ventilator in an intensive care setting (Franklin, 2002). Non beating heart donors are used rarely as death has been determined by the heart stopping and cessation of their respiratory function and are therefore associated with increased warm ischemic time which can damage the donor organs (Bartucci, 2006). However, the increased use of such donors is one initiative that is being considered to help try and meet the current demand for organs for transplantation (Verran et al, 2005).

Live kidney donation may be either directed (i.e. a donation between family members or friends) or non directed. Non directed live donation (altruistic) is a relatively new practice in Australia and involves a complete stranger donating their kidney to someone on the waiting list. Due to the legal and ethical issues associated with this form of donation it is only available in some Australian hospitals (NHMRC, 2007).

Key Words

kidney, transplant, nurse, dialysis

In 2006, 43% of the kidney transplants undertaken in Australia were from live donors (ANZDATA, 2007). For the recipient live donation has many benefits compared to receiving a kidney from a deceased donor. These benefits include better matching between the recipient and donor, shorter ischemic times and the ability to prepare both mentally and physically for the operation. These factors contribute to higher rates of graft survival and a greater chance of immediate post operative function compared to those who have received a kidney from a deceased donor (Franklin, 2002, Bartucci, M 2006, ANZDATA, 2007).

Preparation for the patient going on to the transplant list.

To undergo kidney transplantation a potential recipient needs to be fit for surgery, be matched appropriately with a donor and able to manage the post operative medication regime for the life of the kidney that they receive. They require full voluntary information to ensure the long process of informed consent is achieved.

The most important role of the nephrology nurse in this process is to help maintain a potential transplant recipient in a healthy condition by providing efficient and effective dialysis. However, it may also involve organizing tests and assessments for the patient and

Author:

Cheryl Wilden RN BN GradDip(Neph) GradDip(Ed) is a Renal Educator at The Queen Elizabeth Hospital in Adelaide, South Australia.

Correspondence to:

Cheryl Wilden, Clinical Education Centre, Woodville Rd, Woodville, SA, 5011, Australia. cheryl.wilden@nwahs.sa.gov.au

providing education. This is essential not only to get the patient onto the list but to help prevent or minimize complications post transplant (Franklin, 2002).

In each of the 5 transplant regions in Australia (Queensland, New South Wales/Australian Capital Territory, Victoria/Tasmania, South Australia/Northern Territory and Western Australia) there are differing acceptance criteria for a patient to go onto a transplant list nonetheless the process undertaken to evaluate the patient is similar (Campbell et al, 2007). Patients need to be aware of this if they plan to relocate to another state where they may not meet the acceptance criteria.

Evaluation of the patient

At the core of the workup and assessment for kidney transplantation is patient education as their understanding, willingness and ability to manage their own care through out the entire transplant process will have a major impact on the success and outcome of their transplant. Education includes providing the patient with information about the actual process and assessments that need to be undertaken along with the risks and benefits of transplantation, the surgical procedure, immunosuppressive medications and the long term out comes. The patient will also need information about rejection and increased risks of infection and malignancy (Siddqi et al, 2005, McCarthy, 2006). In addition, those people who suffer diabetes will need specific re-education given the significant changes to their medications and the consequences of these for their diabetes management.

A thorough patient history is undertaken and will include establishing the cause of their kidney disease, family history, co – morbidities and infectious disease exposure. A complete physical assessment is also required to determine that the patient is suitable to undergo a surgical

procedure and to identify potential issues that will need to be managed post transplant. Cardiovascular evaluation is especially important pre-transplant as cardiovascular disease is the leading cause of death post transplant of patients with functioning renal grafts (Siddqi et al, 2005). It also during the work up that contraindications to transplantation, such as malignancy or obesity are identified.

Tissue Typing

The second aspect of evaluation of the patient involves determining their blood group and tissue type. This is so that the patient can be matched to a compatible donor prior to transplantation. Matching donors and recipients is necessary to reduce the risk of rejection which is caused by the host’s immune defense response (Bartucci, 2006).

The activation of the immune system in transplantation occurs because the immune cells are able to recognize “self” and “non self” as a result of the human leukocyte antigens (HLA) or markers that are located on all nucleated cells within the body. HLAs are a series of inherited paired proteins known as A, B, C, DR, DP, DQ. It is the A, B and DR proteins that are thought to have the biggest impact on eliciting an immune response in transplantation (Smeltzer & Bare, 1992).

HLA proteins on an individual’s cells indicate to the body’s immune surveillance cells that they belong “to self”. When foreign HLA antigens are introduced into the body, as they are in kidney transplantation, the cells of the donor organ tissue are recognized as having different HLA and induce an immune response which will lead to antibody production. These antibodies will then cause rejection and ultimately destruction of the transplanted organ (Smeltzer & Bare, 1992). Therefore in order to reduce the risk of rejection and increase the survival of the transplanted organ the following steps

are undertaken in the work up process and at the time of transplantation.

Firstly, the patient’s blood group and tissue type is identified so that the recipient and donor can be matched. A differing blood type will activate an immune response and whilst transplantation across ABO blood groups is possible it requires a month long desensitization process and cannot yet be done when receiving a kidney from a deceased donor (Danovitch, 2005, Coates et al, 2007).

In HLA matching only a genetically identical donor would have a perfect match. Therefore the aim is match the recipient with a donor who has the closest HLA A, B, DR match (Danovitch, 2005). In Australia kidneys are allocated according to blood group and degree of matching, others factors such as time on dialysis and degree of sensitization are also considered (TSANZ, 2008).

The degree of sensitization is determined by assessing how many antibodies the potential recipient has made against foreign HLA. Antibodies against different HLA are formed when the immune system is exposed to foreign tissue types. Therefore, a patient who has had a previous transplant, pregnancy or blood transfusion will have preformed antibodies circulating in their blood. At the time of transplantation a final cross match is undertaken. In this test the serum of the donor and recipient are mixed. If there is a positive reaction it means that the recipient has formed antibodies already against the donor and the transplant can not go ahead as rejection will occur immediately. Only those with a negative cross math are eligible for transplant (Franklin, 2002, Mudge et al, 2006).

The nephrology nurses role may involve the collection blood samples for the initial first and second presentation to the cross matching service for blood grouping and tissue typing . It will certainly however involve sending

monthly samples once the patient is accepted on the list. These monthly serum samples are used for screening cytotoxic antibodies and detecting changes in sensitization. They are also used for cross matching against potential donors. It is therefore important to ensure that patients on the transplant list have their blood sample sent regularly and if they receive a blood transfusion have antibody screening repeated 14 days post transfusion (Australian Red Cross, 2007).

The final step taken to minimize the body's defense system's response involves the patient taking medications that suppress the patient's immune system to stop it from responding to the foreign transplanted graft. Consequently, a significant aspect of the transplant workup process involves identifying any issues that the patient may develop once on these medications. For example if a they have a malignancy this will proliferate more rapidly once the immune system is suppressed and are therefore not suitable to go onto the transplant list (Danovitch, 2005).

In summary, the transplant work up process involves much more than ensuring the patient is fit for surgery. It is about ongoing assessment of the risks and benefits of transplantation to the patient so that they can have the best health outcomes possible.

Whilst they are waiting on the list

A significant factor in determining survival and outcome on any modality is the individual's state of health. This underlines the importance of the nephrology nurses role in managing anemia, calcium/phosphate, fluid status and nutritional status of the patient. The nephrology nurse may also play a pivotal role in encouraging the patient to maintain engage in healthy behaviors. Encouraging the patient to maintain a healthy body mass index is especially important as this will help prevent complications such as wound breakdown and infection post transplant (McCarthy, 2006). The nephrology nurse spends the most time with their patients so they need to keep the transplant team informed of any changes in the patient's health or contact details and ensure that if there are concerns about the patient's health or suitability for transplantation that they are followed up.

Questions

1. Identify those patients in your unit who are on the transplant waiting list.
2. Summarise the assessments your patients need to undertake to get onto the transplant list.
3. Identify the Transplant Liaison Nurse that is responsible for the care of the patients on the transplant list in your unit.
4. Outline the guidelines for your State regarding organ allocation from the following link <http://www.tsanz.com.au/organallocationprotocols/kidneyprotocol.asp>

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