

Associated Factors of Post Renal Transplant Failure

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ABSTRACT

Renal transplantation is the best management for patients suffering from end-stage renal disease (ESRD). It has many benefits which overcome the complications of dialysis, it has some acute and long term complications that could result in failure. Failure of transplant is the fourth cause of death among patients with end stage kidney disease. The causes of failure is still a debate but rejection, drug toxicity and fibrosis as well as chronic allograft nephropathy and patient's immunity related factors. This review will provide important information regarding the causes associated with post-renal transplant failure.

Keywords: Post transplant failure, Causes, risk factors, complications.

INTRODUCTION

Renal transplantation is the best management for patients suffering from end-stage renal disease (ESRD) during different stages of life and has been increased significantly even with older patients. In western countries, even patients older than 60 years old have been waiting for kidney transplant especially among Asians and Americans which had doubled during the last 10 years^(1,2).

The mortality rates was decreased among elderly ESRD patients who had undergone renal transplantation and the quality of life was improved in comparison with patients on regular dialysis⁽³⁻⁵⁾.

Although, the transplantation has many benefits which overcome the complications of dialysis, it has some acute and long term complications that could result in failure⁽⁶⁾. The late kidney transplant failure is an important problem that could increase the mortality rates and the admission to dialysis again⁽⁷⁾.

Failure of transplant is the fourth cause of death among patients with end stage kidney disease. The causes of failure is still a debate but rejection, drug toxicity and fibrosis as well as chronic allograft nephropathy and patient's immunity related factors⁽⁸⁻¹⁰⁾. This review will provide important information regarding the causes associated with post-renal transplant failure.

Causes of post-renal transplant failure

Rejection:

Various factors are associated with transplant failure and the most common cause is associated with the immune system of the recipient's body thus causing rejection. Rejection is based on recognizing the donor's kidney antigens which attacks it as foreign body^(11,12).

The management of rejection is based on using anti-rejection treatments that could conquer the immune system of the recipients which would in turn give chance to kidney to function. Despite using medications and proper precautions, rejection could still happen^(13,14).

1. Hyperacute rejection

It is the type of rejection that occurs when the transplanted kidney is rejected within minutes to hours due to the destruction of vasculature. It is a type of humeral mediated immunity of the recipient that happens when the recipient has prior antibodies in contradiction of the graft and this could be due to previous transplantation or blood transfusion and multiple pregnancies⁽¹⁵⁾. Activation of the antigen-antibody complex could result in activation of the complement system thus induce formation of massive thrombosis inside the capillaries thus inhibit the graft vascularization^(16,17).

2. Acute rejection

It is the type of rejection that occurs usually during the first 6 months post-transplantation. The acute cellular rejection could be mediated by activating lymphocytes which is enhanced against the lymphoid tissue of the donor's antigen. The leukocytes of the donor's dendritic cells could move into the circulation and work as an antigen-presenting cells (APCs).

3. Humoral rejection

This type is occurs either as hyperacute or during the first week. It is mediated by the complement and antibody system occurs when the allograft is injured and result in consequent dysfunction. The antibodies could be developed

after transplantation which could result in proteinuria, thus the antibodies of the donor are detected thus it is important for determination of the rapid decline in the glomerular filtration rate and graft failure^(18, 19).

Some donors have low levels of specific antibodies which could be related to outcomes in the inferior renal allograft and can't be detected using flow-cytometer analysis and complement-dependent cytotoxic cross matches thus, the donors may need amplified immunosuppression⁽²⁰⁾.

4. **Chronic rejection (Chronic allograft nephropathy)**
This type could develop during months to years post-transplant and associated with episodes of acute rejection before the onset of chronic type. It could occur due to cellular or antibody mediated immunity thus using immune-suppressive medications and typing methods for tissues could increase the survival rate in many cases but not among most of them^(21, 22).
It occurs as scarring and fibrosis of the transplanted tissue and could be associated with prior acute rejection episodes, improper usage of immunosuppressive drugs, injury of transplanted organ, ischemia, delayed graft function and donor or recipient related factors⁽²³⁻²⁵⁾.

Clot

Blood clots could occur in the blood vessels of the transplanted kidney thus decrease the blood flow or even completely stop it, thus no blood flow reaches the kidney thus stop its function^(26, 27).

Fluid collection

Fluid may be collected around the newly transported kidney thus could damage the kidney through pressure if not treated. It could be diagnosed using ultrasound and then drained^(28, 29).

Infection

Infection could result in permanent problems for the transplanted kidney especially if left untreated or missed during diagnosis. They are major causes of mortality and disease morbidity among the kidney recipients^(30, 31). Infections could be prevented through early and proper screening and adherence to post-transplant medications as well as screening^(32, 33). Also, some medications and toxins could be harmful to the kidneys.

The most common sites of infection include mucocutaneous tissues followed by urinary and

respiratory tract. The most prevalent infective agents include bacteria and viruses as varicella, cytomegalovirus and herpes simplex virus^(34, 35).

Donor kidney problems

Some donors may have kidney problems, thus the kidney may function well or never function which in turn could result in increasing the failure rates of the transplanted kidney.

Non Adherence

Non commitment or adherence to anti-rejection and immunosuppressive medications could increase the chances of the immune system to recognize the kidney as a foreign body, this increases the risks of rejection to the transplanted kidney^(36, 37).

Managing the transplant failure

The management of transplant failure could be done only through undergoing dialysis again or re-transplantation. However, some may die from depression and kidney failure complications⁽³⁸⁾.

CONCLUSION

Until now there are no accurate causes of post-renal transplant failure as this is a complicated issue. But it is advised to adhere to medications as well as proper management. Early diagnosis of the causes could increase the survival rates and the quality of life.

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