

Renal Transplant is an Established and Successful Treatment for End-Stage renal Failure in Bahrain

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Objective: To evaluate the clinical and cost effective factors involved in the management of end stage renal disease, haemodialysis versus transplantation.

Design: Retrospective analysis of 57 patients who underwent renal transplantation for end stage renal disease from February, 1995 to Dec, 1999.

Setting: Salmaniya Medical Complex, Bahrain.

Participants: 57 Patients on haemodialysis for long period (3-5years) because of end stage renal disease, belonging to age groups 2.5-68 yrs (mean 32 years) including 5 children who received renal transplant.

Main outcome of Measures: Renal parameters of creatinine and urea improved in all the cases and even the high risk group showed improvement in the primary illness, and ejection fraction in the case of cardiomyopathy.

Result: Renal transplantation was done in 57 patients showed restoration of renal function and active life during the 44 months of follow up.

Conclusions: It is estimated that approximately BD 1.3 million (\$ 4 million) are spent annually on renal failure patients and with the increase in population and the increased incidence of metabolic disorders such as Diabetes, this is likely to reach

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alarming proportions. Further more the commonly employed method of haemodialysis to treat renal failure is not cost effective and also not free from morbid sequelae. The present study emphatically demonstrates that renal transplantation is a superior modality to combat renal failure.

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Bahrain is a small island situated in the middle of the Arabian Gulf with land area of 677 Sq.km, and with a population of 577,000. The total number of physicians are approximately 550 and the total number of Nephrologists are 5.

The per capita income is about US \$ 10208 per annum and per capita annual budget of Ministry of Health US \$ 232. The government of Bahrain spends more than 8% of the gross national product (GNP) on health. The population per doctor is 703 and there is only one Nephrologist per 100,000 population. The bed per 100,000 population is 287.

The annual incidence of end stage renal disease (ESRD) in Bahrain is estimated at about 120 per million population. 80% of the ESRD had an access to renal support in the form of dialysis and transplantation.

The etiology of ESRD in many cases is based on clinical assessment because most of the patients present very late to the Nephrologist.

The common causes of ESRD seen in Bahrain are chronic glomerulonephritis, diabetes mellitus, congenital polycystic kidney disease, hypertension and chronic pyelonephritis.

The estimated mortality rate of haemodialysis patients is around 10% annually. Therefore end stage renal disease is one of the principal causes of morbidity and mortality in Bahraini population. Haemodialysis continues to be the major modality of management in ameliorating the serious sequelae. However, this method is not free from complications and patient compliance slowly deteriorates resulting in high mortality. Further, haemodialysis is not cost effective both for the patient and to the hospital.

As Eggers¹ said “ Renal transplantation has now become the treatment of choice for patient with end stage renal failure. It significantly improves the quality of life for patients as well as being a much cheaper alternative to maintaining on dialysis”

This study is to evaluate the clinical and cost effective factors involved in the management of end stage renal disease, haemodialysis versus transplantation.

METHOD

Between May 1995 and June 1999, 57 recipients aged (2.5 to 67 years) received renal allograft. The indication for transplant was end stage renal failure irrespective of the etiology. The male female ratio was 4:1, five patients were children aged 2.5 – 11 years.

The source of grafts for all patients was from living genetically related donors in 53 cases and from spouses in 4 cases. Transplantation was carried out according to established protocol²; average age was 32 years (13-70 years). The protocol, benefits and hazards of surgery were explained to the patients.

Immunosuppression was with triple therapy, consisting of prednisone, cyclosporine and azathioprine³⁻⁶. In certain selected patients Cellcept (MMF)⁷⁻¹⁰ was used for a short period. Fifty-six of these recipients are alive with functioning grafts (98%) at 1-44 months after transplantation.

Histocompatibility

Serological methods were used for both class I and class II HLA- typing¹¹. All HLA-alleles were identified with no blanks.

T-cell and B-cell cross matching was carried out using the standard complement-dependent lymphocytotoxicity¹² and the flow cytometry¹³.

Panel Reactive Antibodies (PRA) was carried out for patients with previous rejections to test for the percentage of their sensitization. Panels containing 56 cells were used which were drawn from our bank of frozen lymphocytes belonging to previously collected kidney bone marrow potential donors .

Out of the 57 living related donors, 43 had one haplotype matching with their recipients, 6 were HLA-identical and 8 had less than one haplotype matching.

Two patients who had previous rejections were sensitized with PRA 40% in one and 70% in the other.

Surgical techniques

Based on selective renal angiography donor's left kidney was used in 47 patients while the right kidney was used in 10. In 56 patients we performed an end to side venous anastomosis between the renal vein and iliac vein. An end to end anastomosis of the renal artery to the hypogastric artery was used in 8 patients and an end to side anastomosis of the renal artery to the external iliac-artery in 49 patients. Two donor kidneys had two renal arteries.

Ureteroneocystomy of Politano-Leadbetter was performed in 54 patients¹⁵. The ureter was stented with polyurethane ureteric double "J" stents in 9 patients. A Foley's catheter was inserted at the time of operation and removed 48-72 hours after transplantation.

Standard surgical techniques were used in all adult recipients with transplantation being placed in the lower quadrant retroperitoneally along with an antireflux ureteroneocystostomy.

In the paediatric recipient (2.5 years) the graft was placed intraperitoneally.

Risk factors

20 patients had additional high risk medical problems including diabetes, coronary artery bypass, cardiomyopathy, Hepatitis C and B, multiple renal calculi with abscess in native kidney, previous multiple surgical procedures for intravertebral disc problems in one patient and one patient with scleroderma¹⁴⁻¹⁶.

All diabetic patients and others with a history of ischaemic heart disease underwent full cardiac assessment including echocardiograph, isotope cardiac study and ejection fraction determination.

RESULTS

Patients survival

Fifty six recipients are alive with functioning grafts (98%) at 4 weeks to 44 months. Only one graft and one patient was lost. No acute rejection was observed in all the patients. One patient died at two months following transplantation because of septicemia pulmonary and embolism. The graft was lost due to DVT which extended to the renal vein? Possible cause was severe CMV infection.

There was no serious rejection or complication.

All recipients are leading an active life with excellent renal function and a serum creatinine ranging from 44-122 mmol/L. All living donors enjoy good health and they resumed their normal life activities within 3-4 weeks after surgery.

DISCUSSION

Renal transplant is an established treatment of choice for end stage renal failure worldwide. The concept of renal transplantation as treatment for end stage renal failure was long recognized by the WHO^{1,17}. The result of the renal transplantation obtained so far in Bahrain has a success rate of 98%. The graft survival rate is comparable with major transplant centers in the world.

It is hoped that better facilities in terms of bed strength, manpower and resources, including a specially designed transplant unit, be made available soon so that the rate of transplantation of 30 grafts annually will meet the national need. In view of the fact that the incidence of renal failure in Bahrain is 130/m population annually, the cost of providing dialysis for each patient is approximately BD 10,000 (\$ 30,000) per year or BD 1.3 million annually (\$ 4 million), while transplant treatment is BD 5000 (\$ 13262) in the first year then BD 2000 (\$ 5305) yearly/patient. There will be considerable saving in the cost of treatment for end stage renal failure patients if this programme is supported by Ministry of Health.

Also it is hoped that the cadaver law will soon be implemented in Bahrain like other Gulf States. This will undoubtedly help to make more organs available for transplantation. In our programme, we do not approve of organ purchase on ethical and religious grounds. Several patients developed serious complications such as infection with hepatitis B & C, AIDS...etc, when they had their transplant done abroad. With regard to trade in organs, it is illegal in Bahrain according to the transplant law which was passed by the late Amir of Bahrain on 16/6/1998.

Even in the high risk group, the outcome of transplantation is excellent during the limited period of follow-up.

Transplantation carried out on patients with Ischemic Heart Disease and cardiac impairment were given appropriate prophylactic support to improve myocardial function and cardiac status. One patient showed remarkable improvement in the left ventricular ejection fraction from 40% to 55% after transplantation¹⁸. This proves that many uraemic patients who develop uraemic myocardial dysfunction can be corrected by successful renal transplantation.

The results are very encouraging and it is hoped that with better facilities being made available and with the expected enactment of a local Cadaver Donor Law, a greater number of kidney transplant could be carried out to meet the demand of nearly 130 patients who are currently on dialysis treatment in Bahrain. Many of these suffer from Type 1 Diabetes. Recent statistics documented that nearly 15-20% of the population of Bahrain suffer from Diabetes mellitus and therefore it can be envisaged that a larger number would need transplant services in the future¹⁹. Enactment of the Cadaver Donor Law will also help to put an end to the current exodus of patients from Bahrain going to other Asian and Middle East countries to buy kidneys with all the related hazards they are exposed to.

CONCLUSION

In conclusion, this paper emphasizes the concept that renal transplantation is not only cost effective but also the choice of treatment for patients with End-Stage Renal Failure rather than dialysis.

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