Nephro-2013

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Nephrology & Therapeutics

July 29-31, 2013 Embassy Suites Las Vegas, USA

Role of kidney and pancreas transplantation in the management of end stage diabetic nephropathy

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Abstract

Epidemiological data from CDC suggest that 16 million (I in 20) Americans suffer from Diabetes mellitus in the United States. Diabetic nephropathy is the primary cause of End stage renal disease (ESRD) in 45% of all patients undergoing chronic dialysis and in 31% of patients living with kidney transplants in the United States (USRDS-2012). Because of the underlying metabolic problems, diabetic renal transplant recipients have significantly higher frequency of infections (bacterial and fungal), rapid progression of occlusive vascular disease (coronary and peripheral arterial occlusion) and bone disease with spontaneous fractures, compared with the non-diabetic control subjects. Those with pre existing clinical vascular disease have significantly lower survival and higher morbidity in the post transplant period. Although the '*invitro*' studies have shown depressed T cell function in a hyperglycemic environment, the risk of clinical acute rejection appears to be equal in both diabetic and non-diabetic renal allograft recipients. In diabetic ESRD patients, renal transplantation provides significant survival advantage compared to chronic dialysis (5 year patient survival: 87% vs. 54%). In the transplanted diabetics, cardiovascular disease accounts for 2/3rds of total deaths and chronic allograft nephropathy for 54% of the graft loss. In those with functioning kidneys, the mean GFR was 73 ml/min. Randomized controlled studies have shown that optimal glycemic control in the post transplant period delays the recurrence of diabetic microangiopathy in the transplanted kidneys. Of those with functioning kidneys at 6 months, 63% have attained full rehabilitation and 31% partial rehabilitation and 6% were disabled.

In type I diabetic ESRD patients, simultaneous Kidney-Pancreas transplantation is the preferred modality of therapy. Compared to cadaver donor Kidney transplantation alone, the addition of pancreas allograft improves the long term survival (10 year survival: 60% vs. 70%). The euglycemic state attained with a functioning pancreas transplant, lowers the cardiovascular mortality by 10% and in addition, improves the cardiac systolic and diastolic function and diminishes the pre existing left ventricular hypertrophy compared to those who received kidney transplant alone. Over a 10 year period, the improved glycemic state also results in reversal of the microvascular lesions of diabetic nephropathy in native kidneys. In summary, renal transplantation offers better long term survival and improved quality of life for type II diabetic ESRD patients and the addition of pancreas transplantation in type I diabetic patients enhances these benefits and also halts the progression of both macro and micro vascular complications. At present, lack of sufficient donor organs is the major stumbling block in improving the long term survival and quality of life of diabetic patients with end stage renal disease.

Biography

Venkateswara K. Rao received his medical degree from Andhra University in India and post graduate training in Nephrology and Renal transplantation at the University of Cincinnati college of Medicine. He served as Medical director of transplantation programs at Minneapolis, Atlanta and Shreveport. He published over 100 articles and served on editorial boards of 3 major scientific journals.