

FREQUENCY AND NOCTURIA AFTER RENAL TRANSPLANTATION IN ADULTS: CAUSES AND CONSEQUENCES FOR THE RENAL TRANSPLANT

Hypothesis / aims of study

Earlier research on LUTS after renal transplantation has shown that the first year following renal transplantation, renal recipients reported significantly more frequency (voiding frequency of 7 times daily or greater) and nocturia (voiding twice or more during the night) than a control group. The aims of the present study are to gain deeper insight into the causes of frequency and nocturia after Tx and to gain insight into the consequences of these symptoms for the renal graft.

Study design, materials and methods

Data were gathered from 52 patients who underwent renal transplantation in our medical centre between July 2003 and August 2004. Data were gathered using medical records, frequency volume charts, cultures, free uroflowmetry and transabdominal ultrasonography. Mean time between Tx and data collection was five months. To gain insight into the factors influencing renal graft function we used estimated Creatinine Clearance rate (Ccr) according to the Cockcroft and Gault formula. The patient's serum creatinine levels and body weight were obtained at two points in time: at three months and at twelve months after Tx. Associations among the LUTS and between the LUTS and Ccr are established using Pearson correlations. To gain deeper insight into the causes of frequency, multivariate OLS regression analyses were performed.

Results

As in previous research, we found many LUTS after renal transplantation in our patients. Only 6 (12%) patients were free of all symptoms. The worst situation: symptoms of dysfunctional voiding combined with both UTI and increased bladder capacity, occurred in 4 (8%) out of 52 patients. Nocturia was not significantly related to Ccr, but frequency was found to have a significant negative effect on Ccr at 12 months ($p=0.034$). We therefore have focused our analyses on the causes of frequency. Symptoms that were significantly and positively related to frequency were UTI after Tx ($p=0.09$), urgency (0.08), bladder pain ($p=0.000$), hesitancy (0.006), sensation of incomplete emptying ($p=0.000$), burning sensation ($p=0.003$), maximum voided volume (MMV) ($p=0.09$), and urinary output ($p=0.000$). Possible causes of frequency among these factors are MMV (small bladder capacity), presence of UTI's, and urinary output (fluid intake). Multivariate OLS regression with frequency as dependent variable and MMV, UTI's, and urinary output as independent variables showed both MMV ($p=0.001$) and urinary output ($p=0.000$) to have independent significant relationships with frequency. Frequency is higher in patients with small bladders and in patients with a high urinary output. Additional analyses showed that MMV was negatively related to bladder pain ($p=0.03$) and that urinary output was positively related to UTI's.

Interpretation of results

Frequency after renal transplantation is a key symptom that may indicate deterioration of the renal transplant. Our analyses suggest that frequency after renal transplantation may have two different causes: (a) low bladder capacity associated with bladder pain due to high pressure, and (b) presence of UTI's leading to high fluid intake.

Concluding message

Dysfunction of the lower urinary tract might harm the transplanted kidney. Key symptoms are frequency, bladder pain, bladder capacity, and UTI's. We recommend urological follow-up for all renal transplant patients using frequency/volume charts, uroflowmetry, PVR, and cultures. Special attention should be paid to the presence of bladder pain.

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HUMAN SUBJECTS: This study was approved by the Ethical committee Radboud University and followed the Declaration of Helsinki Informed consent was obtained from the patients.