Renal Functional Reserve of Transplanted Kidneys

M.	Michel	Dhaene ^a
J.-P.	Jean-Pierre	Sabot ^a
Y.	Yvan	Philippart ^b
J.-M.	Jean-Marc	Doutrelepont ^a
J.-L.	Jean-Louis	Vanherweghem ^a
C.	Charles	Toussaint ^a

Departments of ^aNephrology and ^bClinical Chemistry CUB Hôpital Erasme, Brussels, Belgium

Michel Dhaene, CUB Hôpital Erasme, Service de Néphrologie, Route de Lennik 808, B-1070 Brussels (Belgium)

Dear Sir,

Protein intake has been shown to raise the glomerular filtration rate (GFR). A renal functional reserve has been defined [1, 2] as the difference between pre- and postprandial GFR following an oral protein load. We wonder whether the investigation of renal reserve could be of interest to transplanted patients.

The renal reserve of 7 transplanted patients was evaluated after ingestion of 2 g of protein/kg body weight in the form of cooked red meat. All patients, aged from 16 to 44 years, were selected on the basis of a standard creatinine clearance superior to 50 ml/min. They had received a kidney graft 3–22 months prior to the study. Their residual renal function before transplantation was negligible. Immunosuppressive therapy consisted of prednisolone (10 mg) and either azathioprine (50–150 mg) or cyclosporin (150–300 mg/daily). Metoprolol (100 mg) was given to 3 patients for hypertension. After drinking 20 ml/kg of water in half an hour, the patients underwent pre- and postprandial creatinine clearances and urinary urea nitrogen excretion measurements. Simultaneous inulin clearances were measured in 4 subjects. Baseline and postprandial GFR were calculated as the mean value of three and four successive clearance measurements.

Detailed results are given in table I: only 3 patients exhibited a significant renal functional reserve after a protein load. The results obtained from inulin clearances were comparable and it should be noted that these 3 patients are set apart by their lower urinary urea excretion. These observations lead to several conclusions. First, they confirm that a denervated kidney is able to exhibit a protein-induced hyperfiltration. Secondly, despite the fact that baseline GFR could already have been raised by the glucocorticoids [3, 4], the response to pro-

Table I. Creatinine clearances and urinary urea nitrogen excretion

Patients	Baseline	Baseline	Postprandial	Renal
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Simultaneous inulin clearance.

Cyclosporin.

Metoprolol.

tein intake has not been impaired in 3 patients. The third outcome is probably the most important: since among transplanted patients with similar baseline GFR, some showed no increase in the postprandial GFR, this implies that these patients are already consuming their renal reserve. In other words, on their regular diet, they present a permanent hyperfiltration which, according to Brenner [5], will lead to an accelerated glomerular sclerosis. It also means that, in relation to the number of functional nephrons these patients have, their regular protein diet is inadequate, as suggested by the higher urea excretion, and should be reduced. The present study also indicates that the measure of the renal reserve could provide a useful means for selecting the transplanted patients who should benefit from protein restriction.

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Dhaene/Sabot/Philippart/Doutreloup/Vanherweghem/Toussaint

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