

They propose that inherited mutations in *COQ2* cause a primary glomerular disease—“*COQ2* nephropathy”—characterized by renal lesions of varying severity and proliferation of dysmorphic mitochondria, but not necessarily neurological manifestations.

Patients were between 6 months and 2 years of age when studied. They had presented with isolated nephrotic syndrome, steroid-resistant nephrotic syndrome (associated with progressive encephalomyopathy in one case) or neonatal renal failure. Genetic analyses detected a homozygous c437G>A mutation, two homozygous c890A>G mutations (harbored by a sibling pair, who had previously been reported), and a combined heterozygous mutation (c590G>A and c683A>G). Electron microscopy of renal tissue from all four patients revealed increased numbers of abnormal mitochondria in glomerular cells, particularly podocytes. Biochemical analysis of skeletal muscle and renal cortex showed decreased activity of respiratory chain complexes II and III and low levels of CoQ<sub>10</sub>. *COQ2* mutations were absent from the 500 control DNA samples analyzed, and from four patients with CoQ<sub>10</sub> deficiency but no renal involvement.

Early identification of *COQ2* nephropathy could, say the authors, enable prompt initiation of ubiquinone supplementation.

**Original article** Diomedì-Camassei F *et al.* (2007) *COQ2* nephropathy: a newly described inherited mitochondriopathy with primary renal involvement. *J Am Soc Nephrol* 18: 2773–2780

## New treatment algorithms for idiopathic glomerular disease

The calcineurin inhibitor ciclosporin is known to be an effective treatment for idiopathic glomerular disease associated with the nephrotic syndrome (INS); however, cohesive guidelines for the use of this agent in patients with INS are lacking.

An international panel of experts has evaluated the merit of clinical data on the use of ciclosporin in the three most common histological variants of INS—minimal change disease (MCD), focal segmental glomerulosclerosis (FSGS) and membranous nephropathy. The algorithms for adults and children that they have developed—which include guidance on

who, when and how to treat, plus treatment goals and recommendations for follow-up—have been published in *Kidney International*.

Cattran *et al.* based their guidelines on the following findings. Ciclosporin successfully induced remission of proteinuria in approximately 80% of steroid-sensitive cases of MCD. Ciclosporin also induced remission and preserved long-term renal function in steroid-dependent and steroid-resistant MCD and in steroid-resistant FSGS. The response rate in FSGS was lower than in MCD, however, and the authors recommend that ciclosporin therapy should continue for at least 12 months in patients with FSGS. Ciclosporin also lowered proteinuria in 70–80% of patients with steroid-resistant membranous nephropathy but, similarly, long-term therapy of at least 1 year was required. Although ciclosporin is generally safe, clinicians need to be vigilant to the risk of nephrotoxicity and should monitor renal function carefully during therapy.

**Original article** Cattran DC *et al.* (2007) Cyclosporin in idiopathic glomerular disease associated with the nephrotic syndrome: workshop recommendations. *Kidney Int* [doi:10.1038/sj.ki.5002553]

## Tacrolimus effective in steroid-dependent minimal change nephrotic syndrome

A recent study found that a 24-week course of oral tacrolimus (along with tapering doses of prednisone) might be an effective alternative to ciclosporin in Chinese adults with steroid-dependent minimal change disease, and might induce remission more quickly than ciclosporin.

The study enrolled 26 Chinese adults with biopsy-proven minimal change disease, steroid-dependent nephrotic syndrome, and a serum creatinine level <133 μmol/l (1.5 mg/dl). Patients were self-assigned to at least 24 weeks of oral tacrolimus ( $n=12$ ; target trough level 4–8 ng/ml) or intravenous ciclosporin ( $n=14$ ; 750 mg/m<sup>2</sup> body surface area once every 4 weeks). All patients also received oral prednisone 0.5 mg/kg/day, tapered to cessation after complete remission (i.e. normalization of proteinuria).

One patient in each group discontinued therapy before completing 24 weeks because of severe drug-related adverse effects

(leukopenia with ciclosporin, and a severe pulmonary infection with tacrolimus). Complete remission occurred in 10 of 13 (76.9%) ciclosporin-treated patients and 10 of 11 (90.9%) tacrolimus-treated patients. Complete remission was achieved more quickly in tacrolimus-treated patients than in ciclosporin-treated patients ( $31.5 \pm 25.8$  days vs  $59.9 \pm 28.3$  days;  $P=0.031$ ). Similar proportions of patients in the tacrolimus and ciclosporin groups successfully withdrew from steroids (72.7% vs 61.5%;  $P=0.683$ ). Overall, 6 out of 10 ciclosporin-treated patients and 5 out of 10 tacrolimus-treated patients maintained complete remission over the mean follow-up period of  $23.0 \pm 10.1$  months after therapy cessation. No patients had signs of clinically significant renal deterioration at the end of follow-up.

**Original article** Li X *et al.* (2007) Tacrolimus as a steroid-sparing agent for adults with steroid-dependent minimal change nephrotic syndrome. *Nephrol Dial Transplant* [doi:10.1093/ndt/gfm637]

### Biocompatible peritoneal dialysis solutions are not superior to conventional solutions

Biocompatible peritoneal dialysis solutions have been associated with improved patient survival, perhaps through improving the function and viability of the peritoneal membrane and preserving residual renal function (RRF).

Fan *et al.* randomized 118 patients starting peritoneal dialysis to receive either a biocompatible ( $n=57$ ) or a standard ( $n=61$ ) peritoneal dialysis solution. The primary end point was the change in RRF, assessed as 24-hour urine volume (Uvol) and the mean of urea and creatinine clearance normalized to  $1.73 \text{ m}^2$  body surface area (nCrCl).

Data were available for 44 patients receiving biocompatible solutions and 49 patients receiving standard solutions. Three months after initiation of peritoneal dialysis, mean Uvol and mean nCrCl were similar in the two groups. At 12 months, both mean Uvol and mean nCrCl had decreased significantly compared with 3-month values in both the standard solution group ( $P<0.0001$  for both) and the biocompatible solution group ( $P<0.0001$  for both), but there were no between-group differences in the magnitudes

of the reductions in these parameters. The incidences of peritonitis and technique failure—defined as death or transfer to hemodialysis—were similar in each group. Diuretic use, changes in serum C-reactive protein levels, and results of peritoneal equilibrium tests were also similar in the two groups.

The authors conclude that biocompatible peritoneal dialysis solutions do not preserve RRF, reduce the risk of peritonitis, or improve technique survival, over a 9-month period.

**Original article** Fan SLS *et al.* (2007) Randomized controlled study of biocompatible peritoneal dialysis solutions: effect on residual renal function. *Kidney Int* [doi:10.1038/sj.ki.5002574]

### Bioplorer® enables rapid quantification of microbial contamination of dialysate

The ability to directly detect microbial cells is vital for ensuring that dialysate is uncontaminated. Conventional approaches to microbial cell detection involve counting colonies after culture on agar. Such culture methods only detect viable cells and take a relatively long time to produce a result. A Japanese group has recently reported a non-culture method of quantifying microbial cells that detects dead as well as viable cells and returns results within as little as 20 min.

The investigators had previously developed 'Bioplorer®' (Matsushita Electric Industrial Co., Osaka-fu, Japan), and tested it with filterable foodstuffs. Bioplorer® automatically analyzes fluorescent microscopic images of cells double-stained with propidium iodide, which labels dead cells, and 4',6-diamidino-2-phenylindole (DAPI), which labels both viable and dead cells. Analysis of freshly prepared dialysate determined the detection limit of Bioplorer® to be 106 cells/100 ml ( $2.0 \log_{10}$ [cells/100 ml]) at a sample volume of 100 ml. No colonies were detected when the same sample was cultured on agar medium. This detection limit is sufficiently below the recommended lower limit for standard dialysate ( $4.0 \log_{10}$ [cells/100 ml]), but would not be suitable for the preparation of ultrapure dialysate. A range of freshly prepared dialysate samples spiked with known quantities of *Bacillus subtilis* were analyzed with both the Bioplorer® method and a culture method, and the results did not differ significantly