FROM THE EDITORS

Peritoneal Dialysis–Associated Peritonitis: Unfinished Business

Despite being a major priority for the renal community since the beginning of peritoneal dialysis (PD), peritonitis remains the main complication of therapy. Peritonitis is the focus of several papers in this issue of *Peritoneal Dialysis International*, which includes discussion of risk factors, rates, organisms, and outcomes. Van Esch and colleagues from Amsterdam report on their 32 years' experience, and although they observed a reduction in the peritonitis rate during that period, that reduction occurred predominantly during the first 20 years. In a detailed accompanying review, Szeto comments that progress on peritonitis rates has been disappointing since the early 2000s, despite several technological advances.

Antibiotic resistance is a growing problem. The Amsterdam group noted a greater requirement to switch antibiotics in recent years and increasing resistance of coagulase-negative staphylococci to cephadrine. A report from India by Prasad *et al.* documents greater than 50% resistance of Enterobacteriaceae to third-generation cephalosporins, with 2 of the 13 identified enterococci being resistant to vancomycin. The authors comment that this experience is not unusual in reports from their region.

De Vriese and Vandecasteele discuss the complex issue of vancomycin intermediate-susceptible *Staphylococcus aureus* (VISA), describing the cellular processes that are associated with reduced responsiveness to this important antibiotic, which is clearly associated with a greater risk of treatment failure. To reduce the rate at which resistance develops, vancomycin has to be carefully prescribed to ensure that adequate levels are maintained, and foreign material in infected patients is removed. The implication for PD is that the clinically convenient (and popular) intermittent dosing schedules might be a risk both for toxicity and for subtherapeutic concentrations. In contrast, continuous-infusion schedules have the potential to combine high local concentrations with low systemic exposure; however, those schedules are less convenient from the clinical perspective. The authors recommend

levels higher than those set out by the International Society for Peritoneal Dialysis infection guideline (1), suggesting trough levels of 15–20 mg/L for intermittent dosing. A short report from Ottawa, Canada, is supportive, noting that lower vancomycin levels achieved during the treatment of coagulase-negative *Staphylococcus* peritonitis were associated with a greater likelihood of relapse (Dahlan and colleagues). To maintain levels above 15 mg/L, their recommendation is that repeat dosing should occur when levels fall below 20 mg/L. Rather paradoxically, an audit from Australia (Tang *et al.*) did not find an association between day 2 gentamicin levels and treatment response for first episodes of gram-negative peritonitis, except when multiple organisms were isolated.

The Kaiser Permanente Renal Registry in Southern California provides the opportunity for detailed exploration of the risk factors associated with peritonitis. Kumar *et al.* reported 2-year technique survival of 61% for patients who experienced at least 1 episode of peritonitis compared with 72% for those who experienced none, and overall rates that were considerably better than those in US Renal Data System reports—or indeed those from Amsterdam. The only factors that predicted lower peritonitis rates were female sex and higher education. A paper from the Brazilian Peritoneal Dialysis Multicenter Study (Proença de Moraes *et al.*) reports on the outcomes of first peritonitis episodes in 474 patients, exploring factors associated with non-resolution, death from peritonitis, and long-term technique failure. In addition to confirming an association between older age, collagenosis as a primary diagnosis, and *Pseudomonas* (but not *S. aureus*) as the causative organism, they also noted an intriguing association between vancomycin use and poorer technique survival. Importantly, the culture-negative rate in their report was high at 41.5%.

Elsewhere, this issue contains reports on the stability of antibiotics when added to dialysis solutions (Marshall *et al.* and Patel *et al.*), a short report from Hyderabad on risk factors for catheter removal in peritonitis (Ram and colleagues), and a report on the successful use of linezolid to treat vancomycin-resistant *Enterococcus* peritonitis (Song *et al.*).

Clearly, research directed at the prevention and management of peritonitis remains of key importance. The most pertinent research questions are summarized in the last section of the 2010 PD infection guideline from the International Society for Peritoneal Dialysis (1), which includes initiatives for prevention, diagnosis, and management. There is much to be done before peritonitis can be consigned to the history books.

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REFERENCES

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