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Management of Infectious Complications of PD: Treatment and Prevention

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Peritoneal dialysis (PD)-related infections, particularly peritonitis and exit-site infections (ESI), remain major causes of morbidity, technique failure, and mortality. Peritonitis is diagnosed when at least two of the following are present: clinical features (abdominal pain and/or cloudy effluent), elevated dialysate white blood cell count ($>100/\mu\text{L}$ with $>50\%$ polymorphonuclear cells), and positive culture. Early recognition and prompt initiation of empirical antibiotic therapy are critical, as treatment delay is associated with worse outcomes. Empirical regimens should provide coverage for both gram-positive and gram-negative organisms, typically using a first-generation cephalosporin or vancomycin combined with a third-generation cephalosporin or aminoglycoside, or alternatively cefepime monotherapy. Subsequent management should be guided by culture results and clinical response. Refractory peritonitis, defined as failure of effluent clearance after 5 days of appropriate therapy, generally necessitates catheter removal. Fungal peritonitis requires immediate catheter removal and prolonged antifungal therapy due to high mortality risk. Strategies to reduce recurrence include optimization of PD technique, retraining, and addressing modifiable risk factors. Prevention remains a cornerstone of PD care. Key measures include prophylactic antibiotics at catheter insertion, meticulous exit-site care with topical antibiotics, and patient education with regular retraining. Additional preventive strategies include antibiotic prophylaxis for invasive procedures and antifungal prophylaxis during antibiotic therapy to reduce fungal peritonitis risk. Modifiable risk factors including hypokalemia, the use of histamine-2 receptor antagonists, and pet exposure should also be addressed. A comprehensive approach integrating early diagnosis, appropriate antimicrobial therapy, catheter management, and preventive strategies is essential to improve patient outcomes and maintain long-term PD viability.

Keywords: peritoneal dialysis, peritonitis, Exit-site infection, Antibiotic therapy