

Taurolidine Peritoneal Dialysis Catheter Lock to Treat Relapsing Peritoneal Dialysis Peritonitis



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Peritonitis remains a primary challenge for the long-term success of peritoneal dialysis (PD) technique and one of the main reasons for catheter removal. Prevention and treatment of catheter-related infections are major concerns to avoid peritonitis. The use of taurolidine catheter-locking solution to avoid the development of a biofilm in the catheter's lumen has obtained good results in hemodialysis catheters for reducing infection rates, although there is scarce literature available regarding its utility in PD. We describe the case of a woman in her 60s who developed relapsing peritonitis due to *Pseudomonas aeruginosa*, with no possibility of removing peritoneal dialysis catheter because she was not a suitable candidate for hemodialysis. After the fourth peritonitis episode caused by *Pseudomonas* species, the use of taurolidine catheter-locking solution was initiated. She received a total of 9 doses, with a favorable microbiological and clinical outcome and no further relapses more than 10 months after taurolidine PD catheter lock treatment was started. We report the successful elimination of an aggressive bacteria after taurolidine PD catheter lock use, with no relevant adverse events.

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INTRODUCTION

Peritoneal dialysis (PD)-related peritonitis remains a major complication and primary challenge for the long-term success of the technique because it is one of the main reasons for peritoneal dialysis catheter removal. Furthermore, bacterial infections caused by *Pseudomonas* species are associated with higher risk for infection relapse and worst outcomes.

In hemodialysis (HD) patients with permanent tunneled catheters, the use of taurolidine catheter lock has shown a reduction in catheter infection rates due to bacterial biofilm inhibition,¹⁻⁴ but there is scarce literature on its use on peritoneal dialysis catheter.⁵⁻⁸ We describe a case of relapsing PD peritonitis due to *Pseudomonas* species in a patient for whom taurolidine peritoneal dialysis catheter lock was used with favorable response and microbial agent eradication.

CASE REPORT

A woman in her 60s was started on automated PD due to dilated cardiomyopathy with fluid overload and chronic heart failure refractory to diuretics. Her estimated glomerular filtration rate was 34 mL/min. After 8 months receiving PD she presented with severe septic shock, bacteremia, and cloudy peritoneal effluent identifying *Pseudomonas aeruginosa* in both blood and peritoneal fluid cultures. Intraperitoneal ceftazidime and tobramycin therapy was started following an antibiogram with good clinical outcome. After completing 3 weeks of treatment, antibiotic treatment was stopped, and the patient had an immediate relapse due to the same microbial agent. At this point, removal of the peritoneal catheter was considered, but she was not deemed a suitable candidate for HD on the grounds of her cardiac function and hemodynamic status.

Another course of intraperitoneal-directed antimicrobial therapy was initiated, with relapses caused by the same bacteria on 3 occasions.

After the fourth peritonitis episode caused by *Pseudomonas* species, Taurolidine-Urokinase (Taurolidine-UK) peritoneal catheter lock was started (TauroLock-UJ25.000; TauroPharm GmbH) according to the following protocol. First, the PD catheter capacity and transfer set used in our unit was measured (5.57 mL) to avoid taurolidine reaching the intraperitoneal cavity. TauroLock was reconstituted as per manufacturer instructions and 0.5 mL of saline solution 0.9% was added to complete the catheter and transfer set volume. This dosage of Taurolidine-UK besides 1 mL of heparin was added to a 1.5-L dwell. Icodextrin was used to ensure appropriate TauroLock permanency (at least 10-12 hours). The PD nurse instilled the long dwell with icodextrin and then after the fill was complete, manually locked the catheter and transfer set with taurolidine.

The dosing schedule was twice weekly doses of TauroLock during the first week, a weekly dose for another 2 weeks, and then monthly until completing 9 doses.

Taurolidine lock was well tolerated, with our patient presenting only mild abdominal discomfort following the infusion that disappeared spontaneously after a few minutes. The patient had a favorable microbiological and clinical outcome, with negative peritoneal cultures and no further relapses more than 10 months after taurolidine treatment.

DISCUSSION

Taurolidine has biocidal activity and biofilm detachment effect.¹ Multiple studies demonstrated the efficacy of taurolidine lock solutions in the prevention of infection in permanent lines, whether oncologic or HD patients.^{2,3}

Furthermore, urokinase is known to physically alter the fibrinous structure of biofilms where organisms remain, thus rendering bacteria more susceptible to the antibiotics administered.⁵

At present, evidence on the use of taurolidine as a locking solution in PD patients is lacking and available publications in this regard are mostly case reports, with fairly different dosages and schedule intervals. Nearly all cases published to date include Gram-positive bacteria⁶⁻⁸ such as *Staphylococcus epidermidis* or *Micrococcus luteus*, with good outcomes eradicating the causative organism except for *Staphylococcus aureus*,⁸ which required catheter removal due to treatment failure. There are no reported cases of peritonitis caused by more troublesome organisms such as *Enterobacteriaceae* or *Pseudomonas* species, known to be more aggressive and have poorer outcomes.

In contrast with previous publications, we report the successful elimination of a threatening bacteria after the use of taurolidine PD catheter lock, with no relevant adverse events.

To our knowledge, this is the first report concerning the total recovery of a refractory *Pseudomonas* PD-related peritonitis after peritoneal dialysis catheter Taurolidine-UK lock. This sealing allowed a patient without other kidney replacement options to remain on PD. We believe that Taurolidine-UK lock should be considered in cases of relapsing or refractory peritonitis, even in case of an aggressive bacteria as in our patient because it could prevent catheter removal and a permanent switch to HD in select cases, although literature is scarce and further studies are needed.

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