Regular Deworming: A Missed Opportunity to Prevent Peritoneal Dialysis-Related Infections in Children

Chronic peritoneal dialysis (PD) is a common dialysis treatment modality used to treat children with end-stage renal disease. Dialysis-related infections are the leading cause of technique failure. *Enterobius vermicularis* infestation indirectly increases the infection rate by causing pruritus around the anus, especially at night. We observed a significant decrease in the total infection rate (2.3 vs 5.4 per patient-year) following regular deworming over a 1-year study period. Regular deworming may be considered to prevent secondary bacterial infections in children on chronic PD.

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Peritoneal dialysis (PD) is one of the common modalities of renal replacement therapy used in children with end-stage renal disease. Peritoneal dialysis-related infections (exit-site infections, tunnel infections, and peritonitis) are the leading causes of technique failure, hospitalization, and increased mortality among these children (1,2). A large number of prophylactic strategies including topical antibiotic prophylaxis and catheter exit-site disinfectants have been taken up to reduce occurrence of PD-related infections (1,3,4).

In spite of regular training of caregiver in the proper use of antimicrobial prophylaxis, we noticed high rates of PD-related infections at our center, mostly caused by *Staphylococcus aureus*, *Pseudomonas* species and *Escherichia coli* (Table 1). Between August 2012 and August 2013 we documented 1.2 episodes of peritonitis, 1.5 episodes of tunnel infection and 2.7 episodes of exit-site infection per patient-year among 18 children on chronic PD. After a meticulous search, we observed that children often contract the infection unknowingly through their contaminated hand after scratching around the anus and genitals, particularly at night, due to pruritus caused

by *Enterobius vermicularis*. Children are mostly affected with *Enterobius vermicularis*, and itching around the anus is a common symptom. Even after best possible hygiene practices (such as washing hands with soap after using the toilet and before handling food, cutting fingernails regularly, and avoiding nail biting), we failed to decrease the infection rate. As pruritus and scratching mostly occur at night during sleep, there is little chance of hand washing.

After obtaining approval from our institutional review board and written informed parental consent, we started regular deworming of all children on chronic PD with oral Albendazole in syrup or tablet form (200 mg for less than 2 years and 400 mg for 2 years of age and older once at night) at monthly intervals over a 1-year study period (September 2013 to September 2014). We documented the presence of *Enterobius vermicularis* ova or cyst and the absence of the same on stool examinations in all children before and after each Albendazole therapy during the study period. There was a significant decrease in the PD-related infection rate during the 1-year study period: we observed 0.4 episodes of peritonitis (incidence risk ratio [IRR] 0.33; 95% confidence interval [CI] 0.18 – 0.54), 0.7 episodes of tunnel infection (IRR 0.46; 95% CI 0.34 – 0.63), and 1.2 episodes of exit-site infection (IRR 0.44; 95% CI 0.28 – 0.74) per patient-year among 22 children on chronic PD in comparison with the previous year (Table 1). During the Albendazole therapy we did not detect any specific drug-related side effect.

We observed a significant decrease in the incidence of PD-related infections among children on chronic PD following regular deworming treatment over the 1-year study period. Regular deworming of children on chronic PD may be considered to prevent secondary bacterial infections, especially in developing countries where thread worm infestation is common. Further study is needed to confirm this observation.

DISCLOSURES

The authors have no financial conflicts of interest to declare.

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TABLE 1
Peritoneal Dialysis-Related Infection Rate Among Children Before and After Regular Deworming

	Episodes/ patient/yr	Before regular deworming ^a (n=18)				Episodes/ patient/yr	After regular deworming ^b (n=22)			
		S. <i>aureus</i>	<i>Pseudomonas</i> spp.	<i>E. coli</i>	Other		S. <i>aureus</i>	<i>Pseudomonas</i> spp.	<i>E. coli</i>	Other
Peritonitis	1.2	37	29	18	16	0.4	31	23	8	38
Tunnel infection	1.5	44	34	12	10	0.7	26	27	7	40
Exit-site infection	2.7	53	19	09	19	1.2	44	11	5	40

^a August 2012 to August 2013.

^b September 2013 to September 2014.

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