Pet-Related Peritonitis and Its Prevention in Peritoneal Dialysis: A Case Study

Infectious peritonitis is a major complication of peritoneal dialysis (PD), accounting for considerable mortality and morbidity of PD patients. Although the usual organisms associated with peritonitis are *Staphylococci aureus*, *Staphylococci epidermidis*, *Pseudomonas* species and other gram-negatives, peritonitis due to zoonotic organisms in the context of close contact with companion animals has been reported in literatures (1–12). On a literature review, 124 cases of peritonitis caused by 12 different zoonotic agents have been reported in PD patients. Thirty of them were following documented contacts with an animal with overall mortality of

13.5% (1). In 27% of the cases, the Tenckhoff catheter had to be removed (1).

Pets are very popular in our society with 63% of households in the United States (2,3) and 45% in Europe (1) with at least one pet, dogs and cats being more popular (2). Evidence-based literature suggests that animals/pets are a life-time companion and can help a person better cope with stressful life events, provide psychological help for the isolated or elderly, decrease depression, improve activities of daily life and increase social interaction. Pets are considered part of the family in many households and have very close contacts with their owners. However, close contact with pets is one of the major risk factors for peritonitis caused by zoonotic organisms (4). In our dialysis unit, we also encountered a patient who had close contact with cats with 3 episodes of peritonitis due to *Pasteurella multocida* over a 6-month period. This prompted us to evaluate the prevalence of pets and pets-related peritonitis in our peritoneal dialysis patients, and to assess the impact of a training session on pet-related peritonitis.

METHODS

This single center prospectively examined the prevalence of pets, pet-related peritonitis and the impact of training on the incidence of pet-related peritonitis in all PD patients in our dialysis unit. Pet-related peritonitis was defined as a zoonotic organism identified with a history of exposure to pets. A questionnaire was initially given, inquiring about ownership of pets. A training session was instituted for PD patients who kept domestic animals. The training included patient education, counseling on hygiene and placement of barriers limiting the pets' access to the dialysis equipment (see Supplemental Appendix A). Questionnaires related to the interactions of the patients with the pets during treatments and/or set-up were distributed to all PD patients before and after the training (see Supplemental Appendix B). The patients were followed for 612 patient-months over 2 years. The prevalence of pets and peritonitis rates were analyzed.

RESULTS

The patient population included 17 males and 11 females (19 Caucasians, 5 Hispanic and 2 each Asian and African-Americans; 26 continuousycler-assisted PD and 2 continuous ambulatory PD) with a mean age of 55 years. The PD patients who kept companion animals were 21% (6/28) compared with 23% (6/26) two years ago, prior to the training. Of the 6 patients who owned pets, 3 patients owned 1 dog each and 2 patients owned 1 cat each and 1 patient owned 2 cats. After the training session, 50% (3/6) of patients allowed pets in the room during set-up and/or treatment as compared to 83% (5/6) before the intervention. Of the 6 patients who owned pets, only 1 patient reported that pets were allowed in the room during set-up while connecting with the cyclor and treatment, whereas the other 2 patients didn't allow pets in the room during set-up but occasionally pets entered the room during treatment. Three patients never allowed their pets to interact during set-up, exit-site care or treatment. There was no significant difference between the number of patients who owned pets and who allowed pets during set-up and/or treatment before and after training (Table 1). However, more patients changed their behavior toward handling pets after training. Subsequently, we had no episodes of peritonitis related to pets in our unit. We routinely enquire and provide a training session and a home visit to PD patients who own or intend to own or interact with pets, at the time of initiation of PD.

DISCUSSION

There are several reviews regarding single infective agents and numerous case reports involving pet-related peritonitis (1–12). A recent International Society for Peritoneal Dialysis position statement review emphasizes the importance of inquiring about ownership of pets and patient education on handling of pets for PD patients (4). To our knowledge, there is no literature on the impact of incorporating an education session for PD patients on

TABLE 1
Outcome of Training on Pet-Related Peritonitis

	Before training	After training
Number of PD patients	26	28
Number of patients who own pets	6 (23%)	6 (21%)
Number of patients who allowed pets in the room during set-up and/or treatment	5 (83%)	3 (50%)
Pets-related peritonitis episodes	3	0

PD = peritoneal dialysis.

pet-related peritonitis. Peritonitis caused by a zoonotic organism is associated, in some cases, with close contact with animals and could pose serious complications (1). Thus, prevention with proper handling of pets is crucial and here we showed that incorporating training sessions for PD patients who own pets has a significant effect on patients' behavior towards pets and pet-related peritonitis. Prevention of pet-related infections requires regular care of pets, careful hand-washing and proper disposal of animal waste (5). In our dialysis unit, the number of patients who owned pets and demonstrated proper handling of pets has increased following our educational training regarding hygiene and placement of barriers limiting the pets' access to the dialysis equipment. Thus, we had no peritonitis in our center related to pets over a 2-year period. On systematic review by Ashley, in 24 reported episodes of peritonitis caused by *Pasteurella multocida*, contact with animals was reported in all the cases (1). The mechanism of transmission is thought to be a cat bite or scratch of the peritoneal dialysis tubing or bags; though transmission without biting or scratching, and even in the absence of any exposure, has been described (1,8). Our index patient with recurrent *Pasteurella multocida* has been free of peritonitis for 3 years after he was given appropriate training on handling pets during peritoneal dialysis treatment.

CONCLUSION

Peritoneal dialysis peritonitis with zoonotic organisms is an increasing medical concern and poses potential serious problems. We recommend a periodic questionnaire, an educational session and a home visit at the time of initiation of PD for all PD patients who have or intend to have pets for their social support to prevent pets-related peritonitis.

DISCLOSURES

The authors have no financial conflicts of interest to declare.

Mekdess Abebe¹
Cheryl Laveglia²
Sunil George¹
Nand K. Wadhwa^{1*}

Division of Nephrology¹
Department of Medicine

School of Medicine
State University of New York at Stony Brook
Stony Brook, NY 11794-8166
Stony Brook Kidney Center²
Dialysis Clinic Inc., Home Program
Stony Brook, NY, 11733

*email: nand.wadhwa@stonybrookmedicine.edu

Supplemental material available at www.pdiconnect.com

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