

Managing Fluid Control in the Peritoneal Dialysis Population

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Fluid control is a topic of concern for every patient on dialysis. In the study in this issue of *CJASN* titled “Evolution over time of hydration status and PD related practice patterns in an incident peritoneal dialysis patient cohort,” Van Biesen *et al.* (1) show how fluid control in patients on peritoneal dialysis (PD) usually improves over time, thereby decreasing mortality.

This study is especially relevant to me because of my own experience of PD, both ambulatory and automated, for a total of 7 years—2 years initiated in 1989 and then, 5 years initiated in 1998. I learned that controlling my fluid intake was extremely important, especially during the summer months.

My health care team allowed me latitude on my choice of solution concentrate. Normally, I was able to use a 1.5% concentrate, because I had learned how to meticulously control my fluid and sodium intake and never had much excess fluid on board. However, once in a while, I needed to use a 2.5% or 4.5% concentrate. I felt that determining the correct concentrate of dialysate was both a science and an art dependent on a number of variables.

I had received excellent training in how to do PD and how to choose the correct concentrate on the basis of weight gain, fluid retention, BP, and other factors. However, one important piece of information was missing from that training. My doctors and nurses never mentioned to me that my body composition and fluid retention could be affected during seasonal climate changes (I lived in New York state, where summer was upward of 90°F and winter could dip below 0°F). I noticed that my body retained extra fluid when it was hot outside, yet during colder months, a 1.5% PD concentrate easily pulled off fluid.

In light of my own observations of the relationship between climate and fluid retention, the results of the study immediately raised a question in my mind. Why did patients in Latin America have a different outcome than those from other regions included in the study? The other geographic regions had a decrease in volume overload in the 3-year study period. “In contrast, in Latin America, volume overload even increased over time despite a high percentage using hypertonic solutions after 2 and 3 years. An influence on volume overload by the use of hypertonic

exchanges might be only limited and possibly superimposed by differences in adherence to salt and fluid restriction” (1).

If there are factors other than dialysate type, dialysate concentrate, or diet that make it more difficult for patients to control their volume overload, patients need to be made aware of this. Clinicians also need to understand this additional factor when evaluating a treatment plan and training the patient.

In my case, in the summer when I used a hypertonic exchange to try and rid my body of the excess fluid, I would experience symptoms, such as dizziness, low BP, cramping, and fatigue. When I would immediately increase my fluid intake to relieve the symptoms, it then seemed my body would display symptoms of fluid overload. I surmised that the hot weather could be causing the inability of my body to give up excess fluid, but no one seemed to cite that as a factor. Information about the effect of climate on fluid retention would have helped me to understand what was happening in my body and more effectively control my symptoms.

On the basis of my experience, I wonder if the year-round hotter climate of Latin America as opposed to most other regions in the study, which have cold seasons, could have been a factor for fluid overload, leading to increased mortality. Continued study of this variable might improve outcomes for patients on PD who live in warmer climes.

The study “Season affects body composition and estimation of fluid overload in haemodialysis patients: Variations in body composition; a survey from the European MONDO database” by Broers *et al.* (2) found that seasonal changes in climate affect fat mass, lean tissue mass, extracellular water, and fluid overload. The conclusion was that “[b]ody composition (BC) and hydration state, assessed by bio-impedance spectroscopy, follows a seasonal pattern which may be of relevance for the estimation of target weight, and for the interpretation of longitudinal studies including estimates of BC” (2).

The study further states that “[extracellular water] and [fluid overload] were actually highest during summer, in contrast to lower inter-dialytic weight gain (IDWG) and systolic BP (SBP) during this season” (2).

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How can we better manage volume overload in patients during seasonal changes? Van Biesen *et al.* (1) used bioimpedance spectroscopy to accurately determine volume overload before initiating PD and then, at regular intervals throughout the following months up to 3 years (the duration of the study). If this is an inexpensive way to monitor volume overload, I believe that it could greatly assist the health care team and the patient in their understanding and implementation of treatment protocols, especially during seasonal changes when fluid retention might otherwise be overlooked. Having additional tools to track and educate patients about real-time volume would allow clinicians to help patients better understand the factors that help or hinder volume overload and homeostasis.

Patients' lives do not always follow a simple linear course. Every day, we adjust many factors to feel our best and enjoy being alive. The health care team is not living in their patients' homes, and they cannot control the patient's moment-to-moment choices necessary to have optimum health. The patient needs to have strong guidance at the beginning and then, be sent forward as an independent individual able to make informed choices about daily treatment protocols.

Acknowledgments

Shari Gilford was diagnosed with ESKD in 1976 at age 11. A three-time kidney transplant recipient, she received her most recent transplant in 2006. She has over 10 years of experience with various dialysis modalities, including CAPD, CCPD, in-clinic hemodialysis, and 2 years of nocturnal home hemodialysis (NHHD). In 2003, she was awarded a Certificate of Achievement for "Successful

Completion of the Hemodialysis Direct Patient Care Training Program," enabling her to do her own treatments in clinic before transitioning to NHHD. She has been an active member of the Renal Support Network (RSN) since 2004, lobbying members of Congress, speaking to groups of patients and professionals (including the 2006 Annual Dialysis Conference in San Francisco), and designing and editing RSN's Live & Give newsletter.

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See related article, "Evolution Over Time of Volume Status and PD-Related Practice Patterns in an Incident Peritoneal Dialysis Cohort," on pages 882–893.