Treatment of Ultrafiltration Loss in Continuous Ambulatory Peritoneal Dialysis

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Dear Sir,

Like Wolfish [1] we noticed that in patients on CAPD with poor ultrafiltration (defined as output volume < input volume using 1.36% w/v dextrose Dianeal 137 bags) the overnight dwell-time resulted in unacceptably high gains of both fluid and osmoles from the peritoneal dialysis fluid. In these patients the net fluid loss over 24 h was very low, or even negative, since with poor ultrafiltration during the daytime dwells, they could never eliminate what they had gained overnight, let alone their dietary fluid intake. We found that our good ultrafilterers were neither better nor worse on long dwells compared with short dwells (fig. 1). Our poor ultrafilterers on the other hand gained considerably more fluid after long dwells compared with short dwells, and this applied to both high strength and low strength glucose bags. This disadvantage associated with the overnight dwell led us to assess discontinuing it in patients with poor ultrafiltration. We have been using CAPD with an empty peritoneum overnight in adult patients with poor ultrafiltration with very encouraging results. Wolfish [1] described the benefits seen in 1 infant, and we can confirm that comparable benefits are seen in adult patients who have developed loss of ultrafiltration unassociated with peritonitis as described by Faller and Marichal [2]. In 3 adults ultrafiltration capacity improved by 740 to 950 ml per 24 h when their normal four exchanges per 24 h (3 daytime and 1 overnight) were changed to four exchanges between 8 a.m. and 10 p.m. and the peritoneum left empty overnight. One further patient was able in this way to reduce from four to two 3.86%-glucose bags per 24-hour period

litre + 2.0

I
J
+ 1.0
-I-
-I-
T
J
Removed

I
 -L
 Gained
 -1.0 J
 10 42 3.86 < 5
 59 53 1.36
 < 5
 20 7 1.36
 > 9
 4 4 3.86 > 9

n

Glucose % Dwell-time, h

I Good; i poor ultrafilterers

Fig. 1. Range of ultrafiltration volumes in good and poor ultrafilterers per 2-litre bag without a significant reduction in the ultrafiltration volume.

In all these patients, improvements were associated with a reduction in the net number of osmoles gained over 24 h, reflecting a reduction in glucose absorbed. There was on average a six-fold increase in volume of fluid eliminated for halving of the concomitant osmolar gain. With an overnight 'rest', as well as avoiding the substantial disadvantages of the long dwell, 2 of our 4 adult patients also improved their ultrafiltration losses per bag during the daytime runs, and all reduced their osmolar gains per bag during the daytime runs, either

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because the dwell times were shorter, or because of partial recovery of ultrafiltration capacity. We are at present studying some of the associated parameters of these improvements, but meanwhile we wish to support Wolfish's [1] recommendations for an empty peritoneum overnight as a useful manoeuvre for ultrafiltration loss in CAPD patients.

2 Faller, B.; Marichal, J.F.: Loss of ultrafiltration in continuous ambulatory peritoneal dialysis: clinical data; in Gahl, Kessel, Nolph, Advances in peritoneal dialysis, pp. 227–232 (Excerpta Medica, Amsterdam 1981).

References

1 Wolfish, N.M.: Loss of ultrafiltration capacity in infants (letter to the editor). Nephron 35:277–278 (1983).