

INCREASED SODIUM REMOVAL WITH STEADY CONCENTRATION PERITONEAL DIALYSIS

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Objectives

Adequate removal of sodium is a challenge with current PD modalities. Increased ultrafiltration volume is associated with sodium retention during APD as a result of sodium sieving. Carry Life® UF is a novel portable ultrafiltration device for PD patients requiring enhanced fluid removal utilizing steady concentration peritoneal dialysis. The therapeutic concept is to maintain a stable dialysate glucose concentration by administering glucose throughout the dwell, to compensate for glucose uptake. A small amount of the dialysate is drained into the device cyclically and a glucose concentrate is added before the fluid is returned to the patient. The aim of this study was to investigate UF-rate and sodium removal using Carry Life® UF.

Methods

Eight stable PD patients were included in the study. Subjects were treated with 5-hour Carry Life® UF treatments using three different glucose doses (11, 14, 20 g/h). An initial fill with 1500 ml, 1.36% glucose PD solution was used. A small volume of dialysate was drained hourly to avoid overflow. A standard 4-hour Peritoneal Equilibration Test (PET) (2000 ml, 2.27% glucose) was used as control. Data expressed as mean ± SD, statistical analysis using one-way ANOVA, **p<0.01 ***p<0.001.

Results

Treatment		UF-rate (ml/h)	Sodium removal (mmol/dwell)	Calculated sodium concentration in UF-volume (mmol/l)	Dialysate sodium concentration end of dwell (mmol/l)
PET		40±60	22±33	135±23	133±3
Carry Life® UF	11 g/h	124±49**	86±27***	136±11	125±3***
	14 g/h	146±63***	92±33***	127±13	121±5***
	20 g/h	168±78***	110±37***	133±16	119±5***

Conclusions

The Carry Life® UF therapy significantly increased sodium removal and UF-rates compared to control. The decreased dialysate sodium concentration with Carry Life® UF leads to an increased sodium diffusion that generates an ultrafiltrate with a sodium concentration similar to PET. In conclusion, continuous glucose administration with Carry Life® UF results in more efficient sodium and fluid removal in PD patients.