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INCREASED REMOVAL RATES OF FLUID AND SODIUM DURING STEADY CONCENTRATION PERITONEAL DIALYSIS COMPARED TO ICODEXTRIN AND PERITONEAL EQUILIBRATION TEST

Carlsson O[1], Heimbürger O[3], Johansson A-C[2], Martus G[4], Wilkie M[5], Hegbrant J[6], Johansson A[1], De Leon C[1]

1. Triomed AB, Lund, Sweden.
2. Department of Nephrology, Skåne University Hospital, Malmö, Sweden.
3. CLINTEC, Karolinska Institute, Karolinska University Hospital, Solna, Sweden.
4. Department of Nephrology, Skåne University Hospital, Lund, Sweden.
5. Department of Nephrology, Sheffield Teaching Hospitals National Health Service Foundation Trust, Sheffield, United Kingdom.
6. Department of Nephrology, Lund University, Lund, Sweden.

Background and Aims

Removal of fluid and sodium may be a major challenge in PD, which can be addressed using icodextrin for the long dwells. Steady concentration PD (SCPD) with Carry Life® UF is a novel treatment modality where the intraperitoneal glucose concentration can be kept stable throughout the treatment maintaining ultrafiltration and sodium removal. This is performed by transferring a small volume of the dialysate into the device, where glucose is added and the dialysate returned to the patient. The present study was performed to compare the effect of SCPD with icodextrin and peritoneal equilibration test (PET) on ultrafiltration and sodium removal.

Method

Eight stable PD patients (high or high average transporters) were included in the study. Subjects were treated with three 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 overfill. An icodextrin 11-hour dwell (2000 ml, 7.5% Extraneal®), and a 4-hour PET (2000 ml, 2.27% glucose PD solution), were used as controls. Data expressed as mean ± SD, statistical analysis using one-way ANOVA, **p<0.01, ***p<0.001.

Results

The treatment time for icodextrin was 11.4±1.5 hours, for PET 4.1±0.1 hours, and for the Carry Life UF treatments 5.2±0.3 hours. Carry Life UF treatments generated increased ultrafiltration rates compared to icodextrin and PET (Figure a). The sodium removal rates with Carry Life UF treatments were also significantly increased compared to icodextrin and PET (Figure b). However, the total ultrafiltration volumes during Carry Life UF treatments were not significantly different compared to the icodextrin dwell (646±256, 739±312, 863±380, 595±239, ml/treatment for 11 g/h, 14 g/h, 20 g/h, and icodextrin, respectively). The ultrafiltration volume during PET was significantly lower than all other treatments

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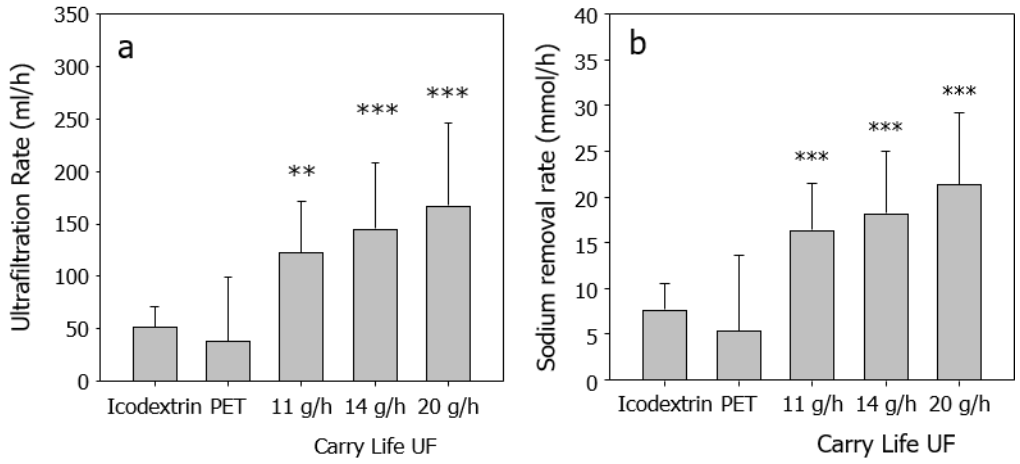
(162±242 ml, p<0.001). Peritoneal sodium removal did not differ between Carry Life UF treatments and the icodextrin dwells (86±27, 92±33, 110±37, 88±34 mmol/treatment for 11 g/h, 14 g/h, 20 g/h, and icodextrin, respectively). Peritoneal sodium removal during PET was significantly lower than during the other treatments (22±33 mmol/treatment, p<0.01).

Conclusion

Treatments performed with Carry Life UF maintain a stable intraperitoneal glucose concentration during the entire dwell, resulting in higher ultrafiltration and sodium removal rates than for controls (PET and icodextrin). The fluid and sodium was removed during the 5-hour Carry Life UF treatments was comparable to the 11-hour icodextrin dwells.
In summary, the increased removal rates of fluid and sodium during SCPD result in a more efficient treatment than conventional CAPD or icodextrin.

Figure



Ultrafiltration rate in ml/hour during icodextrin, PET, and Carry Life UF treatments (a). Sodium removal rate in mmol/h during icodextrin, PET, and Carry Life UF treatments (b).