

This is a Fresenius Medical Care summary of:

Long-term clinical experience with pure bicarbonate peritoneal dialysis solutions

Montenegro J et al. *Perit Dial Int* 2006;26:89-94

Introduction

Pure bicarbonate-buffered peritoneal dialysis (PD) fluids (PDFs) apparently offer better biocompatibility due to a physiological buffer, a neutral pH and the absence of glucose degradation products as compared to conventional lactate-buffered solutions.

Objective

The intention of this investigation was to collect long-term data on a 34 mmol/L bicarbonate-buffered PDF with a pH of 7.4 (BIC) and compare it with a 35 mmol/L lactate-buffered PDF with pH 5.5 (LAC) in clinical practice.

Design

This prospective, open, non-randomised study was performed in one PD centre in Spain. Incident continuous ambulatory peritoneal dialysis patients were eligible and allocated to either solution according to the availability of BIC. Patients were prescribed three 2 L-bag exchanges per day with individualized glucose concentrations. Follow-up time was 12 months, with 5 study visits during this time. A peritoneal function test was performed at the start and end of the study.

Results

36 patients were included, 18 in each study group. The groups were comparable in terms of baseline demographics, although there were more females and fewer patients with interstitial nephritis in the BIC group.

Over the entire study, the BIC group displayed higher venous serum bicarbonate and base excess levels, albeit the difference did not reach statistical significance. Four patients in the LAC group, but no patient in the BIC group required oral bicarbonate supplementation.

Diuresis, glomerular filtration rate (GFR), and renal urea ($K_{r_{urea}}$) and creatinine ($K_{r_{crea}}$) clearances tended to increase under BIC, but declined significantly under LAC (Table). Corresponding to the declining diuresis per day, ultrafiltration increased in the LAC group over time, but remained relatively stable in the BIC group.

Cause	LAC		BIC	
	Baseline	12 months	Baseline	12 months
Diuresis (ml/day)	1186 ± 652	839 ± 556*	1127 ± 635	1333 ± 935
GFR (ml/min)	6.2 ± 2.3	5.3 ± 2.4*	5.5 ± 2.8	6.5 ± 3.4
$K_{r_{urea}}$ (ml/min)	4.9 ± 1.9	4.5 ± 1.7*	4.3 ± 2.2	5.5 ± 3.0
$K_{r_{crea}}$ (ml/min)	7.5 ± 2.9	6.2 ± 3.4*	6.7 ± 3.5	7.5 ± 3.9

*p<0.05 for linear trend

Table based on data from the study.

Conclusion

BIC showed an improved correction of acidosis while oral bicarbonate supplementation was dispensable. In addition, it might better preserve residual renal function and diuresis.