Clinical effects of standard and individualized dialysate sodium on chronic hemodialysis patients

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OBJECTIVES

Prescription of dialysate sodium still remain unclear question for chronic hemodilaysis patients. Will patients have some beneficial effects of dialysate sodium set up according to serum sodium or sodium profiling is the aim of the study.

METHODS

In the study were included 92 non- diabetic subjects (men 52; women 40), with dialysis vintage 78.91+/-67.52 months, on high flux bicarbonate dialysis, frequency 3 time/week and residual renal diuresis below 300 ml/day. In the first phase patient performed 12 connsecutive HD sessions (4 weeks) with dialysate sodium concetration set up on 138 mmol/L (standard sodium), followed by 24 sessions (second phase) wherein dialysate sodium was set up according to average pre – HD plasma sodium (individualized sodium – meassured pre-HD plasma sodium concentration every months, 12 months before start of study). After the first phase, hipotensive prone patients received dialysis with sodium profiling (145-138 mmol/L) and other two groups received dialysis with individualized sodium. Variables of interest were: sistolic, diastolic and mean blood pressure, pulse, IDWG (interdialytic weight gain), thirst score (Xerostomia Inventory (XI) and Dialysis Thirst Inventory (DTI)) and side effects (episodes with hipotension and muscle cramps).

RESULTS

Sodium individualization resulted in significantly lower blood presure and IDWG in hipertensive patients compared to standard sodium. In hipotensive prone patients there was no statical significant change in blood presure, but they had significantly increase in IDWG (2.06 vs 2.21, p= 0,020) compared to standard sodium. Normotensive patients with higher than 138 mmol/l dialysate sodium had no statistical significant change in SBP (116.57 vs 115.10, p=0.488), DBP (70.12 vs 70.27, p=0.895), MAP (85.60 vs 85.21, p=0.777) and pulse (67.74 vs 69.49, p=0.303), but with significant increase in IDWG (1.92 vs 1.70, p=0.019) compared to standard dialysed sodium. Patients with equal or lower than 138 mmol/L dialysate sodium had no significant change in SBP (125.03 vs 124.72), DBP (74.14 vs 74.04), MAP (91.10 vs 90.94) compared to standard sodium, but with significant decrease in pulse (70.39 vs 73.29, p=0.000) and IDWG (2.09 vs 2.28, p=0.000). Analysis of subjective feeling of thirst and dry mouth in both phase show statistical significant difference in normotensive patients, but there was no statistical significant difference in hipertensive patients. In hipotensive patients scores were higher after dialysis with profiling sodium compared to standard sodium, but it was no statistical significant. During the second phase only 1 episodes of hipotension and 10 cases of muscle cramps were noted in normotensive patients, while the other patients didn't complain on side effects.

Variables	Normotensive No 76		Hypertensive No 11		Hypotensive No 5	
Age	60.46±13.15		58.72±7.41		60.50±4.41	
serum sodium	136.77±1.47 [1]		136.36±0.24 [1]		136.66±1.50	
	Standard Na	Individualized Na	Standard Na	Individualized Na	Standard Na	Profiling 145-138
sodium gradient	-1.21±1.49	//	-1.63±0.80	//	//	//
SBP	123.46±13.86	123.92±13.51	153.60±14.26	133.61±11.88[1]	86.94±5.63	89.63±5.67
DBP	73.55±8.89	73.61±9.16	87.85 ±6.08	78.61±4.73 [1]	54.05±2.32	55.02±2.07
MAP	90.18±9.53	90.38±9.68	124.21±23.80	96.94±5.95 [3]	67.81±5.30	68.88±4.70
Pulse	72.79±8.75	70.04±7.42 [1]	74.74±6.25	72.91±6.15	76.79±3.55	74.05±2.77
IDWG	2.21±0.72	2.06±0.65 [2]	2.21±0.93	1.87±0.92 [4]	2.45±0.17	2.74±0.19 [5]
XI score	17.94±6.83	15.00±5.60 [1]	18.00 ±10.19	13.45±5.59	17.33±3.72	19.00±4.14
DTI score	12.60±4.71	10.53±-4.08 [1]	11.90±5.88	10.27±3.49	16.00±5.89	17.00±4.00
Sp Kt/V	1.49±0.27	1.50±0.24	1.42± 0.30	1.43±0.19	1.53±0.16	1.58±0.24

CONCLUSIONS

The optimal dialysate sodium is not well definite and it's depend of clinical circumstances. In hipertensive and stabile normotensive patients isonatremic or dialysis with lower dialysate sodium should be performed. Higher dialysate sodium in stabile patients and sodium profiling in hipotensive prone patients increase IDWG, but with no influence on blood presure, suggesting that some other factors are involved what require more investigations.

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