A simple method to estimate daily sodium Intake during measurement of dialysis adequacy in chronic peritoneal dialysis patients

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Background

Although many guidelines recommend restriction of the dietary sodium intake in patients with peritoneal dialysis (PD), detailed information about the measurement and monitoring of sodium intake is limited. We tried to develop a simple method to estimate daily salt intake during measurement of dialysis adequacy in peritoneal dialysis in this study.

Patients and methods

This study enrolled 83 peritoneal dialysis patients, who visited the PD Clinic at the Asan Medical Center during July 2010 to August 2011. Based on the presence of residual renal function (RRF), the patients were divided into RRF positive(RRF+) and negative (RRF -) groups. The correlation between the daily sodium intake using 1-day dietary recall and total sodium removal presented with sum of peritoneal sodium and urinary sodium was analyzed and the linear regression equation was calculated.

Study design

This study is observational cross-sectional study.

Results

There were 39 patients in RRF (-) group and 44 in RRF (+) group. Baseline characteristics, mean age, gender, blood pressure, hypertension medication were not different between the two groups, except shorter duration of peritoneal dialysis in RRF(+) group. The mean dietary sodium intake showed no difference in both groups. There were significant positive correlations between the sodium intake and the total sodium removal and in RRF (-) group and RRF (+) (r=0.598), respectively. There was a linear relationship between dietary sodium intake and total sodium removal in both groups as follows; RRF (-) group: sodium intake (mg/d) = 19.28 x peritoneal sodium removal (mEq/d) + 211, RRF (+) group: sodium intake (mg/d) = 15.40 x total sodium removal (mEq/d) +609. All PD patient : sodium intake (mg/d) = 15.64 x total sodium removal (mEq/d)+646.

Table 1. Patient characteristics

	RRF(-) group (n= 39)	RRF(+) group (n=44)	P-value
Age, years	48±15	55±15	0.05
Male gender, n(%)	22(56)	27(61)	0.66
Height, cm	161.6±6.8	161.8±10.0	0.91
Weight, kg	60.8±11.2	64.8±11.3	0.10
Systolic blood pressure, mmHg	125.8±27.3	132.1±22.4	0.26
Diastolic blood pressure, mmHg	76.0±13.5	77.8±11.8	0.52
Antihypertension drug, n	2.5±1.9	2.4±1.8	0.67
Etiology of ESRD, n(%)			0.66
Diabetes Mellitus	21	26	
Non-Diabetes Milletus	18	18	
Mode of peitoneal dialysis, n(%)			
CPD/APD	25/14	26/18	0.65
Use of icodextrin, n(%)	19/20	14/30	0.17
Tranporter type			0.82
of peritoneal membrane, n (%)			
High	10(26)	14(32)	
Normal	26(66)	27(61)	
Low	3(7)	3(7)	
Duration of peritoneal dialysis, years	5.9±3.7	2.5±2.0	<0.01

Table 2. Dietary sodium intake and total sodium removal

	RRF(-) group (n=39)	RRF(+) group (n=44)	p-value
Total Energy intake, kcal	1463±445	1485±445	0.82
Dietary sodium intake, mg/day	2992±1066	3402±1197	0.10
Total sodium removal, mEq/day	144.9±33.2	181.3±44.8	<0.01
Peritoneal sodium removal, mEq/day	143.6±32.9	144.8±41.6	0.88
Urinary sodium removal, mEq/day	4.25±0.56	36.4±19.2	<0.01
Total fluid removal, L/day	1.47±0.26	1.78±0.29	<0.01
Peritoneal ultrafiltration volume, L/day	1.46±0.27	1.22±0.22	<0.01
Urine volume, L/day	0.008±0.02	0.555±0.23	<0.01
Residual renal function, mL/min	0.48±0.66	2.82±3.02	<0.01
Glucose concentration of dialysate (%)	1.92±0.40	1.74±0.43	0.06
nPNA	1.78 ±0.77	1.80±0.91	0.90
Weekly peritoneal Kt/V	2.08±0.75	1.85±1.01	0.28
Weekly renal Kt/V	0.03±0.01	0.56±0.65	<0.01
Weekly total Kt/V	2.08±0.75	2.41±1.23	0.18

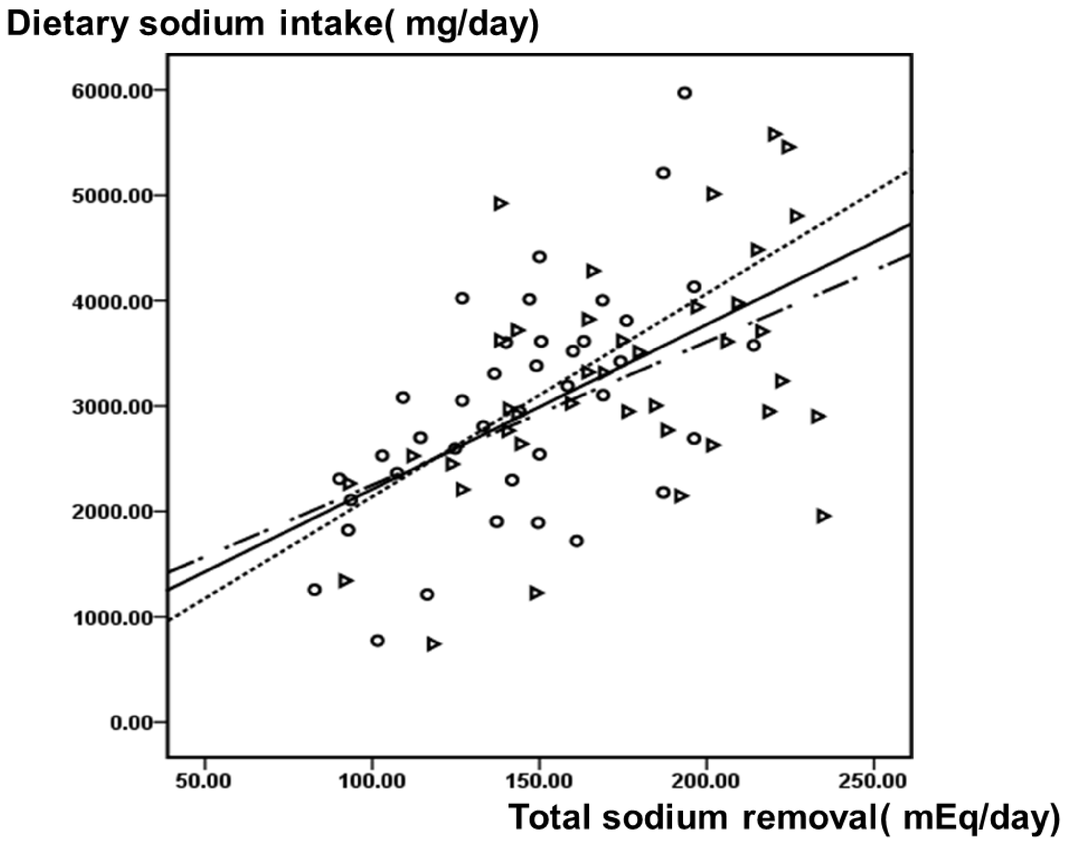

Figure 1. Correlations between dietary sodium intake and total sodium removal in PD patients with residual renal function

Conclusion

A dietary intake of 2000mg of sodium corresponds to approximately total sodium removal 88mEq/d in PD patients. The total sodium removal could be an effective and simple method to estimate dietary sodium intake in PD patients regardless of residual renal function.

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