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The Appropriate Nutritional Re-Education in Hemodialysis Patients: Analyzed with dietary intake

Jin Su Kim[1], Jeeyeon Kim[1], Bum Soon Choi[2], Tae Hyun Ban[2], Yu Jung Choi[3]
[1]Department of Nutrition Services , The Catholic University of Korea Eunpyeong St. Mary's Hospital, Korea, Republic of
[2]Department of Internal Medicine-Nephrology, The Catholic University of Korea Eunpyeong St. Mary's Hospital, Korea, Republic of
[3]Department of Clinical Research Coordinator of Nephrology , The Catholic University of Korea Eunpyeong St. Mary's Hospital, Korea, Republic of

Objectives : This study set out to determine the appropriate timing for nutritional education by analyzing changes of the nutritional indicators in hemodialysis (HD) patients during 24 weeks after education.
Methods : A total of 18 HD patients was included. Dietary intake was analyzed through 3-day food records and collected at baseline, 0, 12 and 24 weeks after education. Nutritional status by Patient-Generated Subjective Global Assessment (PG-SGA) and biochemical data was collected at 0, 12, 24 weeks. In order to evaluate the education effect in detail, subjects were divided into two groups; those with no education experienced and those with education experienced before this study (No-EE and EE group).
Results : The intake of energy, protein, animal protein, calcium and phosphorus had increased from baseline to 24 weeks. Compared to baseline, the improvement of dietary intake was more significant at 0 and 12 week(s) than 24 weeks. The PG-SGA score showed a better nutritional status at 12 weeks (4.61 vs. 2.67 score, 0 week vs 12 week, $P<0.05$). The dietary intake in No-EE group was increased at 12 weeks. On the other hand, the dietary intake and nutritional status in EE group were improved at 24 weeks. There were no biochemical changes for 24 weeks.
Conclusions : There was an inverted U-shaped effect in dietary intake and nutritional status for 24 weeks after education. Nutritional indicators showed the greatest improvement at 12 weeks. The PG-SGA nutritional triage recommends nutritional intervention even under the improvement of PG-SGA score. No-EE group had the greatest improvement in dietary intake immediately after education, and EE group have improved even through 24 weeks. Therefore, patients with HD for the first time should be educated at the beginning of HD and re-educated at least every 12 weeks, and patient who have had educated more than twice, should be recommended to re-educate within 24 weeks.

Table1.jpeg

Table1. Overall changes in dietary intake and biochemical data from baseline to 24 weeks after education

		Time			
		Baseline	0 week	12 week	24 week
Dietary intake					
Energy (kcal)	Total (n=18)	1005.55±327.72	**1282.89±335.17*** **	**1203.2±357.88***	**1162.51±324.49***
	No-EE (n=6)	1005.91±361.26	1337.57±486.38	1343.43±412.26	1097.06±344.36
	EE (n=12)	1005.37±326.59	**1255.55±252.28****	1133.09±323.42	1195.23±324.53
Protein (g)	Total (n=18)	34.74±14.34	**47.51±14.10*** **	**47.22±17.22***	**44.55±13.37****
	No-EE (n=6)	32.30±14.33	**46.83±17.85***	**53.01±20.43***	39.94±18.34
	EE (n=12)	35.96±14.82	**47.85±12.73***	44.33±15.53	**46.85±10.30***
Protein_animal (g)	Total (n=18)	14.13±10.83	**19.32±7.39***	**22.27±11.77***	**20.05±8.41***
	No-EE (n=6)	13.78±10.18	19.43±6.54	**26.24±15.87***	**†13.63±9.03**
	EE (n=12)	14.31±11.58	19.26±8.07	20.29±9.31	**†23.26±6.20***
Calcium (mg)	Total (n=18)	235.86±122.16	**410.47±163.70*** **	**411.20±189.19*** **	**418.87±250.66****
	No-EE (n=6)	284.48±152.82	**425.83±185.97***	**485.58±214.42***	459.74±245.14
	EE (n=12)	211.55±102.53	**402.79±159.7****	**374.01±172.90****	**398.44±261.58***
Phosphorus (mg)	Total (n=18)	504.82±191.74	**658.94±156.18****	**674.76±258.08***	**620.00±177.52***
	No-EE (n=6)	508.92±174.02	**661.45±175.46***	**782.72±279.66***	579.73±225.46
	EE (n=12)	502.76±207.45	**657.68±153.94***	620.79±240.52	640.14±155.79
Potassium (mg)	Total (n=18)	1219.53±559.02	1379.80±388.64	1383.07±485.82	1281.98±314.32
	No-EE (n=6)	1130.56±321.47	1347.98±252.19	1591.87±541.16	1297.21±353.18
	EE (n=12)	1264.02±655.38	1395.72±451.32	1278.67±442.68	1274.37±309.51
Biochemical data					
Albumin (normal 3.5-5.2)	Total (n=18)		3.81±0.41	3.87±0.27	3.95±0.21
	No-EE (n=6)		3.73±0.52	3.77±0.24	3.83±0.10
	EE (n=12)		3.86±0.36	3.93±0.28	4.00±0.23
Urea Nitrogen (normal 8.0-20.0)	Total (n=18)		63.61±23.52	70.61±16.24	66.52±26.66
	No-EE (n=6)		67.80±23.23	75.25±15.35	65.48±24.66
	EE (n=12)		61.51±24.4	68.29±16.83	67.03±28.66
Creatinine (normal 0.61-1.20)	Total (n=18)		9.86±3.77	10.49±3.39	10.41±3.34
	No-EE (n=6)		9.40±2.77	9.50±2.21	9.60±1.80
	EE (n=12)		10.09±4.27	10.99±3.83	10.82±3.9
Phosphorus (normal 2.5-4.5)	Total (n=18)		4.50±1.31	4.53±1.21	4.77±1.61
	No-EE (n=6)		4.25±1.48	4.68±0.95	4.07±1.71
	EE (n=12)		4.63±1.26	4.46±1.35	5.12±1.52
Potassium (normal 3.5-5.1)	Total (n=18)		4.82±0.61	5.07±0.60	4.71±0.70
	No-EE (n=6)		5.03±0.87	5.18±0.71	5.10±1.06
	EE (n=12)		4.71±0.44	5.02±0.56	4.52±0.33

1) No-EE =No education experienced before this study, EE=Education experienced before this study
2) Data are presented as Mean±SD
3) Difference between baseline and 0, 12, 24 week(s) follow-up using Wilcoxon signed rank test, *p <0.05, **p<0.01 ***P<0.001
4) Difference between two group using PROC GLM, *p<0.05

Table1.jpeg

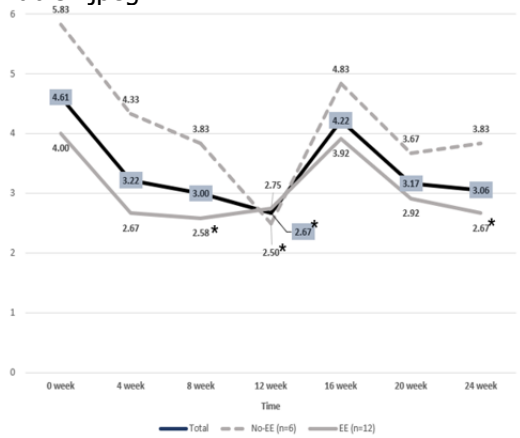

Figure1. Overall changes in numerical PG-SGA score from baseline to 24 weeks after education.

1) PG-SGA
Additive PG-SGA score is used to define specific nutritional interventions including patient & family education, symptom management including pharmacologic intervention, and appropriated nutrition intervention.
[Triage based on PG-SGA point score]
0-1 No intervention required at this time.
2-3 Patient & family education by dietitian, nurse, or other clinician with pharmacologic intervention as indicated by symptom and lab values as appropriate.
4-8 Requires intervention by dietitian, in conjunction with nurse or physician as indicated by symptoms.
2) Data are presented as Mean
3) Difference between baseline and 0, 12, 24 week(s) follow-up using Wilcoxon signed rank test, *p<0.05.