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## **Effects of Online hemodiafiltration on various parameters in patients with end-stage renal disease**

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**Objectives:** Online hemodiafiltration (OL-HDF) offers a great advantage in clearance of various sized molecules. However, the evidence on effects of OL-HDF for other various indices like laboratory data, quality of life, or nutritional status are scarce. In this cohort study, we compared patients characteristics on HD or HDF treatments. In addition, we investigated the change of laboratory values after switch to OL-HDF at least during more than 12 months.

**Methods:** Adult patients with end-stage renal disease undergoing hemodialysis were prospectively enrolled in K-cohort (CRIS no. KCT0003281) comprised of 6 tertiary hospitals of South Korea. Between June 2016 and December 2018, we recruited 435 patients, and 339 patients were on HD at initial point. Among 187 patients who followed up for more than 24 months, 44 patients switched to HDF and maintained for more than 12 months. We used paired t-test to compare baseline and 24 months later follow-up results.

**Results:** The mean age was  $62.5 \pm 12.7$  years, and 64.6 % of the population was male. Serum protein and albumin level were significantly lower in HDF group ( $6.7 \pm 0.5$  vs.  $6.5$   $P=0.002$ ,  $3.8 \pm 0.3$  vs.  $3.7 \pm 0.4$ ,  $P=0.001$ ). The physical function ( $67.5$  vs.  $50.3$ ,  $P<0.001$ ) and role limitation due to emotional problem ( $39.7$  vs.  $27.1$ ,  $P<0.001$ ) based on KDQOL questionnaire were also significantly lower in HDF group. However, emotional well being was significantly higher in this group ( $38$  vs.  $46.2$ ,  $P<0.001$ ) In 44 patients switched from HD to OL-HDF, the level of Hgb, Ca, calcium-phosphorus product and albumin were the only parameters that correlated with switch to OL-HDF ( $p = 0.001$ ,  $<0.001$ ,  $0.013$ , and  $0.001$ , respectively).

**Conclusions:** In conclusion, OL-HDF was associated with better subjective symptoms and long term treatment during more than 24 months affected improvement of anemia and nutritional benefit.

Table 1. Baseline characteristics of study participants

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Characteristics	Overall (n =435)	HD (n =339)	HDF (n =96)	P-value
Male, n (%)	281 (64.6)	207 (61.1)	74 (77.1)	0.007
Age, years	62.5 ± 12.7	62.7 ± 12.5	61.9 ± 13.5	0.605
HD duration, months	3.90 ± 0.22	3.89 ± 0.22	3.94 ± 0.22	0.042
Diabetes, n (%)	229 (52.6)	179 (52.8)	50 (52.1)	0.908
OH vitamine D	17.8 ± 11.2	18.1 ± 10.9	16.8 ± 12.2	0.343
Hemoglobin, g/dL	10.4 ± 1.2	10.5 ± 1.2	10.1 ± 1.4	0.004
Protein, g/dL	6.6 ± 0.5	6.7 ± 0.5	6.5 ± 0.5	0.002
Albumin, mg/dL	3.8 ± 0.3	3.8 ± 0.3	3.7 ± 0.4	0.001
Creatinine, mg/dL	9.3 ± 2.9	9.1 ± 3.0	9.9 ± 2.8	0.017
Calcium, mg/dL	8.5 ± 0.8	8.5 ± 0.8	8.6 ± 0.9	0.347
Phosphate, mg/dL	4.8 ± 1.4	4.8 ± 1.4	4.9 ± 1.4	0.419
iPTH, mg/dL	264.2 ± 216.8	251.4 ± 207.3	301.2 ± 244.5	0.047
T. cholesterol, µg/dL	6.6 ± 0.5	139.2 ± 31.1	130.5 ± 32.2	0.018
LDL cholesterol, mg/dL	77.9 ± 26.8	77.7 ± 25.4	78.5 ± 31.1	0.806
Beta2MG	24.5 ± 8.3	24.1 ± 8.5	25.6 ± 7.5	0.191
Duration (hr)	3.90 ± 0.22	3.89 ± 0.22	3.94 ± 0.22	0.042
Blood flow rate (ml/min)	267.5 ± 23.7	263.7 ± 21.2	281.0 ± 26.9	<0.001
URR	72.9 ± 6.6	72.2 ± 6.6	75.2 ± 6.2	<0.001
Kt/V	1.63 ± 0.24	1.5 ± 0.3	1.7 ± 0.3	0.001

Table 2. 24-months laboratory outcome

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		<b>HD → HDF (n=44)</b>	<b>HD → HD (n=143)</b>
Hgb	Baseline (g/dL)	10.46 ± 1.03	10.60 ± 1.13
	After 24 months (g/dL)	11.08 ± 0.82	10.78 ± 1.09
	P by paired t-test	0.001	0.099
Ca	Baseline (mg/dL)	8.32 ± 0.75	8.75 ± 0.80
	After 24 months (mg/dL)	8.75 ± 0.80	8.24 ± 0.93
	P by paired t-test	<0.001	0.000
P	Baseline (mg/dL)	5.01 ± 1.33	4.89 ± 1.36
	After 24 months (mg/dL)	5.52 ± 1.46	4.89 ± 1.48
	P by paired t-test	0.078	0.219
Ca X P	Baseline	41.89 ± 12.62	42.75 ± 12.64
	After 24 months	50.80 ± 20.79	41.50 ± 12.78
	P by paired t-test	0.013	0.271
nPCR	Baseline(g/kg/day)	1.07 ± 0.25	1.01 ± 0.20
	After 24 months(g/kg/day)	1.03 ± 0.21	0.98 ± 0.18
	P by paired t-test	0.433	0.071
Albumin	Baseline (mg/dL)	3.73 ± 0.29	3.94 ± 0.28
	After 24 months (mg/dL)	3.87 ± 0.30	3.89 ± 0.32
	P by paired t-test	0.001	0.165