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unplanned hemodialysis and related factors in chronic kidney disease patients

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Objectives: Although it is difficult to predict the timing of dialysis in patients with chronic kidney disease (CKD), it is an important role for nephrologist. As CKD progresses, it is necessary to consult with the patient about dialysis modality and access. In many countries, central venous catheter (CVC) is the most common initial hemodialysis (HD) access. HD catheter use causes many complications and increases patient mortality and morbidity. The use of an HD catheter in initial HD in patients with end stage renal disease (ESRD) is not planned dialysis and many factors may be related. We conducted retrospective cohort study to find out these factor.

Methods: A total of 411 CKD patients who started maintaining HD using permanent access were enrolled. Planned HD was defined when a patient started HD using vascular access, And patients who started HD using CVC were defined as unplanned HD.

Results: The mean age of the enrolled patients was 54.2 ± 14.8 (yr), and the frequency of underlying kidney disease was diabetes mellitus (DM) (54.3%), hypertension (30.7%), glomerulonephritis (9%), and polycystic kidney disease (5.6%) in that order. The mean of eGFR at the time of referral to nephrologist was 33.6 ± 21.3 (mL/min/1.73m2). A total of 159 patients (38.7 %) were in the planned HD group, and 252 patients (61.3 %) were in the unplanned HD group. Unplanned HD risk slightly increased with age. Increase in eGFR and high body mass index slightly reduced unplanned HD risk. Among underlying kidney diseases, DM significantly increased the risk of unplanned HD. (HR = 1.71 [1.26 to 2.30], p = 0.001).

Conclusions: We investigated factors related to unplanned HD. Patients with diabetic nephropathy, old age, and decreased renal function at the time of referral are at risk of unplanned HD, so vascular access needs to be prepared earlier.

risk factors for unplanned hemodialysis

- Table 2. Univariate and multivariate analyses of independent risk factors for unplanned hemodialysis. HR, hazard ratio; 95% CI, 95% confidence interval; eGFR, estimated glomerular filtration rate; DM, diabetes mellitus; HTN; hypertension; GN, glomerulonephritis; PCKD, polycystic kidney disease

Risk Factor	Univariable		Multivariable	
	HR (95% CI)	*p*-value	HR (95% CI)	*p*-value
Female	1.01 (0.79 to 1.30)	0.924	1.01 (0.75 to 1.37)	0.933
Age (at the time of referral)	1.03 (1.02 to 1.04)	<0.001	1.02 (1.01 to 1.03)	0.003
Body mass index	0.97 (0.93 to 1.00)	0.06	0.94 (0.91 to 0.98)	0.001
Smoker	1.06 (0.80 to 1.42)	0.68	1.22 (0.87 to 1.72)	0.257
Cardiovascular disease	1.21 (0.92 to 1.59)	0.168	1.07 (0.79 to 1.43)	0.672
Underlying kidney disease				
DM	1.60 (1.24 to 2.07)	<0.001	1.71 (1.26 to 2.30)	0.001
HTN	0.93 (0.70 to 1.22)	0.594	1.53 (0.21 to 11.3)	0.676
GN	0.59 (0.37 to 0.96)	0.032	1.44 (0.19 to 11.1)	0.727
PCKD	0.37 (0.19 to 0.71)	0.003	1.09 (0.13 to 8.91)	0.934
eGFR (at the time of referral)	0.99 (0.98 to 0.99)	<0.001	0.98 (0.97 to 0.99)	<0.001

enrolled patients

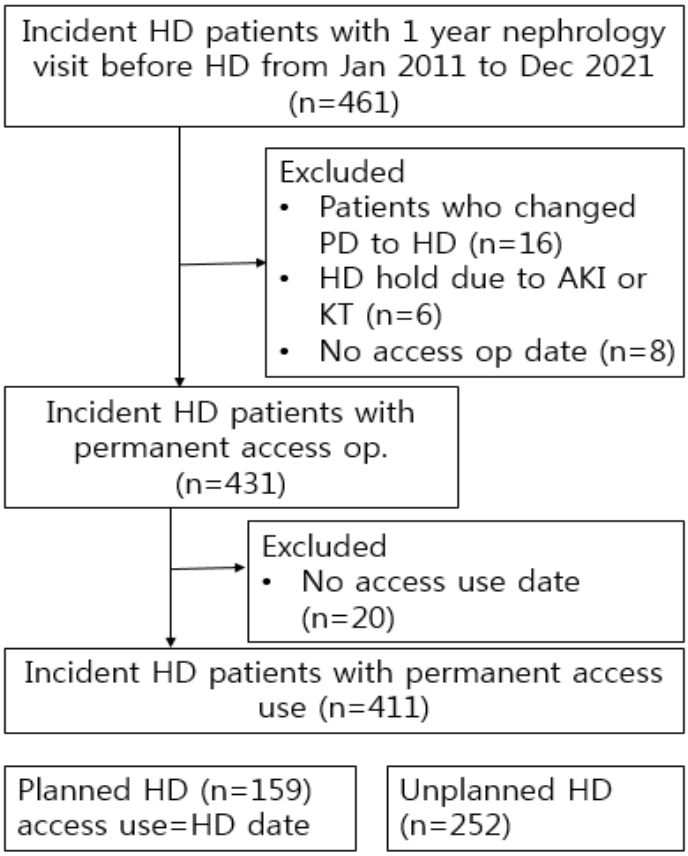

Figure 1. Enrolled patient with chronic kidney disease