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Diagnosis of heart failure with preserved ejection fraction in hemodialysis patients by heart failure scoring system, a retrospective-cohort study

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Objectives : Diagnosis of heart failure is based on symptoms and signs of cardiac dysfunction plus left ventricular ejection fraction(LVEF). However, symptoms and signs of heart failure can be confusing in most patients with renal disease, making HFpEF difficult to differentiate from volume overload in patients with ESRD. From 2018, the ESC guideline of heart failure(HFA-ESC) introduced diagnostic algorithm for HFpEF, and Mayo clinic introduced different scoring system(H2F-PEF). We compared these two scoring systems in the patients with ESRD on hemodialysis sessions.
Methods : Patients were enrolled from our prospective cohort, with inclusion criteria of age older than 18 years and treatment with HD or HDF for at least 3 months. A total of 863 patients were recruited, and 572 patients are included. 46 patients had LVEF below 50%, so we tried to examine 526 patients. By using the HFA-ESC guideline, we sorted patients into the HFpEF group that met 2 major criteria because the BNP data were absent. For the H2FPEF score, we sorted patients with intermediate scores (2~5) in the HFpEF group. We compared these two scoring systems and surveyed risk factors and overall survival rates for each scored patient.
Results : 407 people were diagnosed with HFpEF, and 119 people were in the low-risk group by the HFA-ESC algorithm. Additionally, 421 people were diagnosed with intermediate likelihood of HFpEF, and 105 people were in the low-risk group by H2FPEF scoring. Patients in the HFpEF group of the H2FPEF scoring system tended to have more severe anemia, lower serum iron, and lower albumin levels despite their higher BMI. We found that the H2F-PEF scoring system could predict the mortality of patients more accurately, even after age-matched Cox regression.
Conclusions : In patients with end-stage renal disease, the H2F-PEF scoring system was a better diagnostic tool for the diagnosis of HFpEF and predicting patient outcomes.

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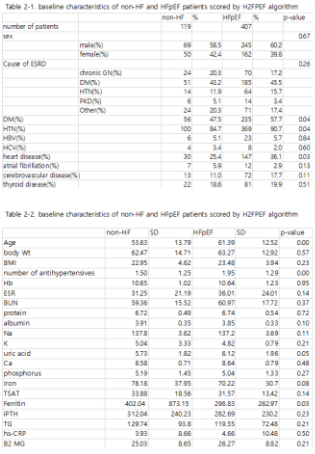


Table 2-1. baseline characteristics of non-HF and HFpEF patients scored by H2FPEF algorithm

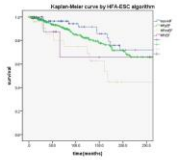
		non-HF	%	HFpEF	%	p-value
number of patients		119		407		
sex						0.67
	male(%)	69	58.5	245	60.2	
	female(%)	50	42.4	162	39.8	
Cause of ESRD						026
	chronic GN(%)	24	20.3	70	17.2	
	DM(%)	51	43.2	185	45.5	
	HTN(%)	14	11.9	64	15.7	
	PKD(%)	6	5.1	14	3.4	
	Other(%)	24	20.3	71	17.4	
DM(%)		56	47.5	235	57.7	0.04
HTN(%)		100	84.7	369	90.7	0.04
HBV(%)		6	5.1	23	5.7	0.84
HCV(%)		4	3.4	8	2.0	0.60
heart disease(%)		30	25.4	147	36.1	0.03
atrial fibrillation(%)		7	5.9	12	2.9	0.13
cerebrovascular disease(%)		13	11.0	72	17.7	0.11
thyroid disease(%)		22	18.6	81	19.9	051

Table 2-2. baseline characteristics of non-HF and HFpEF patients scored by H2FPEF algorithm

	non-HF	SD	HFpEF	SD	p-value
Age	53.83	13.79	61.39	12.52	0.00
body Wt	62.47	14.71	63.27	12.92	0.57
BMI	22.95	4.62	23.48	3.94	0.23
number of antihypertensives	1.50	1.25	1.95	1.29	0.00
Hb	10.85	1.02	10.64	1.23	0.95
ESR	31.25	21.19	36.01	24.01	0.14
BUN	59.36	15.52	60.97	17.72	0.37
protein	6.72	0.49	6.74	0.54	0.72
albumin	3.91	0.35	3.85	0.33	0.10
Na	137.8	3.62	137.2	3.69	0.11
K	5.04	3.33	4.82	0.79	0.21
uric acid	5.73	1.82	6.12	1.96	0.05
Ca	8.58	0.71	8.64	0.79	0.48
phosphorus	5.19	1.45	5.04	1.33	0.27
iron	76.18	37.95	70.22	30.7	0.08
TSAT	33.88	18.56	31.57	13.42	0.14
ferritin	402.04	873.15	296.83	262.97	0.03
iPTH	312.04	240.23	282.69	230.2	0.23
TG	129.74	93.8	119.55	72.48	0.21
hs-CRP	5.93	8.66	4.66	10.48	0.50
B2 MG	25.03	8.65	28.27	8.82	0.21

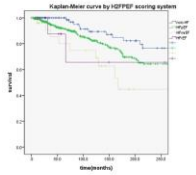
table.png

Figure 1. Kaplan-Meier curve for survival rates among non-HF and HF patients, using HFA-ESC algorithm



The odds ratio was 1.397(p=0.303), age-matched odds ratio was 1.016(p=0.002)

Figure 2. Kaplan-Meier curve for survival rates among non-HF and HF patients, using H2FPEF scoring system.



The odds ratio was 1.908(p=0.046), age-matched odds ratio was 1.020(p=0.000)