

Prognostic value of echocardiography for CKD patients with HF with reduced EF initiating hemodialysis

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Background: Heart failure (HF) is highly prevalent in patients with chronic kidney disease (CKD). Among the CKD patients initiating hemodialysis, left ventricular (LV) systolic dysfunction was reported up to 15 %. The aim of this study was to evaluate value of echocardiography to determine adverse cardiac outcomes in CKD patients with heart failure with reduced ejection fraction (HFrEF). **Methods:** In this retrospective study, we surveyed 843 patients with both advanced CKD and HF who were starting hemodialysis in our hospital during the period 2005 - 2015. HFrEF was defined by LVEF $\leq 50\%$ with symptoms of HF. We inspected echocardiography, comorbidity, medication, laboratory findings in 94 patients with advanced CKD and HFrEF. The primary endpoint was comparison of echocardiographic parameters between hospitalization group and non-hospitalization group and secondary endpoints was all cause mortality in between two group. **Results:** 40 (42 %) patients were hospitalized caused by HF, and 18 (19.1 %) patients were deceased. Before initiation of hemodialysis, LV end-systolic (LVESd) and end-diastolic diameter (LVIDd) were higher in patients with experience of hospitalization due to HF than patients without hospitalization (LVESd: 60.5 ± 8.14 mm vs 56.5 ± 7.16 , $p = 0.016$) (LVIDs: 46.5 ± 9.2 vs 41.7 ± 8.0 , $p = 0.01$). Also There was a difference in relative wall thickness (RWT) between the two groups (0.334 ± 0.073 vs 0.365 ± 0.077 , $p = 0.047$) The 4.3-year survival rates of two group were 93.2% and 56.4 respectively by the Kaplan-Meier survival estimation ($p = 0.005$). **Conclusions:** In CKD with HFrEF, LVIDs, LVIDd and RWT were strong predictors for adverse cardiac outcomes. Identification and measurement of LVIDs, LVIDd, RWT significantly improve risk stratification in high risk population

Hospitalization due to heart failure	Yes (n=40)	No (n=54)	p-value
LVEF	38.9 ± 8.40	36.7 ± 8.38	0.206
LVIDd	60.5 ± 8.14	56.5 ± 7.16	0.016
LVIDs	46.5 ± 9.2	41.7 ± 8.0	0.01
RWT	0.365 ± 0.077	0.334 ± 0.073	0.047

Age Criteria Modification of Risk Scores Predicting Stroke in Patients with Atrial Fibrillation

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Background: Recently, it was suggested that lowering the age threshold for stroke risk estimation help identify truly low stroke risk in Taiwan atrial fibrillation (AF) patients. This study hypothesized that lowering the cutoff age in current risk stratification scores might provide better stroke prediction. **Methods:** We included non-valvular AF patients not using oral anticoagulants (OACs) from 506,805 adults in prospective cohort data collected by the National Health Insurance Service in Korea. The younger age groups of the current risk scores were divided into 2 subgroups by a cutoff of 55 years. We assigned -1 point to the younger subgroup (< 55 years of age) and did not change the points assigned to other groups. The modified risk scores were compared with each original score by calculating the c-statistics and net reclassification improvement (NRI). **Results:** During 14,430 person-years of follow-up, we observed 188 ischemic strokes. C-statistics for the full point scores improved after modifying the age criteria in all the risk scores (CHA₂DS₂-VASc: from 0.74 to 0.75; CHADS₂: from 0.74 to 0.76; R₂CHADS₂: from 0.74 to 0.75). The NRIs were positive comparing the modified score with each original score (CHA₂DS₂-VASc: 27.1%; CHADS₂: 4.7%; R₂CHADS₂: 2.2%). **Conclusions:** By using the lowered cutoff age (55 years of age), refining the age criteria of current risk scores provided improved stroke prediction in atrial fibrillation patients.

Table. C-index values and NRI for current risk schemes before and after modification of age criteria

Risk stratification scheme	C-index (95% confidence interval)					NRI** Full cohort (n=3,932)	
	Full cohort (n=3,932)		p*	Primary prevention cohort (n=3,286)			
	Before	After		Before	After		
	Modification			Modification			
CHA ₂ DS ₂ -V ASc	0.74 (0.70 to 0.77)	0.75 (0.71 to 0.78)	< 0.01	0.68 (0.63 to 0.73)	0.70 (0.65 to 0.75)	< 0.01	27.1%
CHADS ₂	0.74 (0.71 to 0.78)	0.76 (0.73 to 0.79)	< 0.01	0.67 (0.62 to 0.73)	0.70 (0.66 to 0.75)	< 0.01	4.7%
R ₂ CHADS ₂	0.74 (0.70 to 0.78)	0.75 (0.72 to 0.79)	< 0.01	0.67 (0.62 to 0.73)	0.70 (0.65 to 0.75)	< 0.01	2.2%

* The p-values refer to the Delong test for differences in ROC prediction.

** Positive NRI values indicate improvement by modification, compared with original scores.