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Impacts of RV Dysfunction on In-hospital Events in Patients with De Novo AHF with DCMP

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Background/Aims: Right ventricular (RV) dysfunction is known to be associated with poor clinical outcomes in patients with heart failure (HF), but the incidence of RV dysfunction using various echocardiographic methods, its hemodynamic significance, and its impacts on in-hospital events (IHE) has been poorly studied in de novo acute HF (AHF) patients with dilated cardiomyopathy (DCMP). **Methods:** RV function was evaluated in a total of 168 consecutive de novo AHF patients with DCMP (58.9±17.4 years old, 105 males). Tricuspid annular plane systolic excursion (TAPSE), fractional area change (FAC) of the RV, lateral annular systolic velocity of tricuspid valve (TV Sm), and RV global longitudinal strain (RVGLS) were measured and used as a parameter of RV function. The correlations between RV functional parameters and NT-proBNP were evaluated. The incidence of IHE including death, mechanical ventilation, shock, and cerebrovascular accident (CVA) was also compared according to the parameters of RV dysfunction. **Results:** The incidence of RV dysfunction was 31.5% by TAPSE, 27.8% by FAC, 55.4% by TV Sm, 71.4% by RVGLS (Figure 1). Among the parameters of RV dysfunction, RVGLS (r=0.286, p<0.001), FAC (r=-0.216, p=0.005) and TV Sm (r=-0.213, p=0.042) showed significant correlation with NT-proBNP, but TAPSE did not show significant correlation with NT-proBNP (r=-0.068, p=ns) (Figure 2). IHE was developed in 22 patients (13.1%); 8 death (4.8%), 17 mechanical ventilation (10.1%), 15 shock (8.9%), 4 CVA (2.4%). IHE was significantly frequent in patients with RV dysfunction than in patients without RV dysfunction (Figure 3); 20.8% vs 9.6% (p=0.046) by TAPSE, 27.7% vs 7.4% (p<0.001) by FAC, 16.7% vs 4.2% (p=0.030) by RVGLS, 21.6% vs 2.4% (p=0.010) by TV Sm. **Conclusions:** RV dysfunction was common in de novo AHF patients with DCMP, and RV dysfunction was significantly associated with hemodynamic burdens as measured by NT-proBNP and IHE. Among various echocardiographic parameters of RV dysfunction, the present study suggested that FAC, RVGLS, and TV Sm can be useful parameters in assessing RV function. Echocardiographic measurement of RV function would be useful in the risk stratification of de novo AHF patients with DCMP.

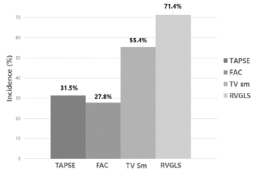

Figure 1. The incidence of right ventricular dysfunction in de novo acute heart failure patients with dilated cardiomyopathy. TAPSE: tricuspid annular plane systolic excursion, FAC: fractional area change, TV Sm: systolic velocity of lateral tricuspid valve annulus, RVGLS: right ventricular global longitudinal strain.

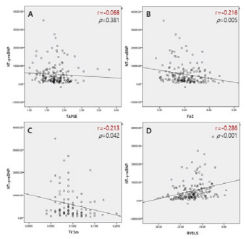

Figure 2. Correlation between right ventricular function and N-terminal pro B-type natriuretic peptide (NT Pro-BNP). Tricuspid annular plane systolic excursion did not show significant correlation with NT-proBNP, but fractional area change (FAC), systolic velocity of lateral tricuspid valve annulus (TV Sm), and right ventricular global longitudinal strain (RVGLS) showed significant correlation with NT-proBNP.

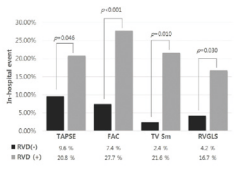

Figure 3. Right ventricular dysfunction (RVD) and in-hospital events (IHE). IHE was significantly higher in patients with RVD than without RVD. TAPSE: tricuspid annular plane systolic excursion, FAC: fractional area change, TV Sm: systolic velocity of lateral tricuspid valve annulus, RVGLS: right ventricular global longitudinal strain.