CHANGES IN TRICUSPID ANNULAR PLANE SYSTOLIC EXCURSION PROVOKED BY EXERCISE DETERMINE THE EXERCISE CAPACITY IN PATIENTS WITH REDUCED LEFT VENTRICULAR EJECTION FRACTION

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Authors: Makoto Amaki, Hideaki Kanzaki, Akira Funada, Hiroyuki Takahama, Takuya Hasegawa, Toshihisa Anzai, Masafumi Kitakaze, National Cerebral and Cardiovascular Center, Suita, Japan

Background: In patients with heart failure, right ventricular function seems important for either exercise capacity or prognosis, but the relation between exercise capacity and tricuspid annular plane systolic excursion (TAPSE) has not been investigated.

Methods: Thirty patients with left ventricular ejection fraction (LVEF) less than 45% (age:51±18 years, NYHA I/II =10/20) underwent supine bicycle exercise echocardiography. The workload increased by 25 Watts every 2 minutes. Peak oxygen consumption (peakVO2) was measured by continuous expired gas analysis. The %change from rest to peak exercise (peak) of each parameter was calculated.

Results: Exercise increased LVEF, cardiac output (CO) and TAPSE, from 26±10 to 32±13% (p<0.001), from 3.6±0.9 to 8.3±3.2L/min (p<0.001) and from 19.3±4.3 to 26.6±7.7mm (p<0.01), respectively. PeakVO2 correlated with age (r=-0.69, p<0.001), plasma BNP levels (r=-0.50, p<0.01) and COrest (r=0.46, p<0.05) but not with LVEFrest or TAPSErest. On the other hand, PeakVO2 correlated with COpeak (r=0.79, p<0.001), TAPSEpeak (r=0.52, p<0.01) and %TAPSE (r=0.56, p=0.001) obtained during exercise, but not with LVEFpeak or %LVEF. In multiple regression analysis, COpeak and %TAPSE remained as determinants of peakVO2 (R2=0.79, p<0.001).

Conclusions: Exercise capacity was associated with TAPSE during exercise rather than TAPSE at rest. Unmasked right ventricular dysfunction may explain functional capacity in patients with heart failure, and may be linked to prognosis.