Abstract Preview

**EuroEcho-Imaging 2018**

Associate Professor Karina Wierzbowska-Drabik (EUD ID: 109483)
Szpital Im. W.Biega-Sklego (Med.Univ.of Lodz)
Klinika Kardiologii (Dept. Of Cardiology)
Ul. Kniaziewicza 1/5
91-347 - Lodz Poland
Phone: +48 42 653 9909 Fax: +48 42 653 9909
Email: wierzbowska@ptkardio.pl

**Title:**
Tricuspid regurgitant velocity and pulmonary flow acceleration time for estimating pulmonary pressure during exercise stress echocardiography

**Topic:**
3.1.10 - Stress Echocardiography

**Category:**
General

**Option:**
No Options

K. Wierzbowska-Drabik, E. Picano, E. Bossone, G. Ciampi, P. Lipiec, J.D. Kasprzak - (1) Medical University, Lodz, Poland (2) Institute of Clinical Physiology, CNR, Pisa, Italy (3) University of Salerno, Salerno, Italy (4) Fetebenefratelli Hospital of Benevento, Benevento, Italy

**Background:** Systolic pulmonary arterial pressure (SPAP) is important during exercise stress echocardiography (ESE) in several conditions, from valvar disease to heart failure. Transthoracic echocardiography (TTE) can estimate SPAP from either tricuspid regurgitation velocity (TRV) or acceleration time (ACT) of systolic pulmonary flow velocity in right ventricular outflow tract.

**Purpose:** To assess the feasibility of TRV and ACT in patients referred for SPAP evaluation during ESE.

**Methods:** We performed rest TTE and ESE in 102 subjects (mean age 49±17 yrs, 50 females) with acceptable acoustic window at rest, capable to exercise and without significant pulmonary valve stenosis. The reasons for referral were: assessment of exercise tolerance in healthy - subjects (n=39) or subjects with risk factors for coronary artery disease (n=30); known or suspected (early, borderline, at risk or established) pulmonary hypertension (confirmed with right heart catheterization: n=33).

TTE rest and stress assessment included: TRV with continuous wave Doppler; ACT (from onset of ejection to peak flow velocity) from pulsed Doppler. Both parameters were measured in 3 conditions: rest, peak exercise, recovery (5 min post). ACT values were also normalized for heart rate (ACT/RR interval and ACT/square root of RR interval).

**Results:** The success rate was 183/306 for TRV and 304/306 for ACT (feasibility: 60 vs 99%, p<0.0001). There was a close linear (R2=0.53, p<0.001) and - even better - quadratic (R2=0.62, R=0.787, p<0.001) correlation between TRV and ACT (see figure). The ACT correction for heart rate (R2=0.35, p<0.001) or square root of heart rate (R2=0.53, p<0.001) did not improve the strength of correlation.
Conclusion: ACT (with no need for heart rate correction) is closely correlated with and substantially more feasible than TRV during ESE. The adoption of the integrated TRV-ACT approach for estimating SPAP during ESE has a clear potential to expand the percentage of patients in whom TTE can be used to quantify pulmonary pressures.

Figure caption: The linear (left) and quadratic (right) correlation between ACT and TRV

Correlation between ACT and TRV