Results.— Hemodynamic conditions were similar before both exams. We found good correlations between: RVEF measured by MSCT scan and RVFAC in TTE (Rho = 0.53; P = 0.002); RVFAC measured by MSCT scan in axial view and RVFAC in TTE (Rho = 0.59; P = 0.0006); RVFAC measured by MSCT scan in apical 4 chambers view and RVFAC in TTE (Rho = 0.58; P = 0.0007); TAPSE scan measured by MSCT scan in axial view and Sa tricuspid annulus in TTE (Rho = 0.60; P = 0.0002); TAPSE scan measured by MSCT scan in apical 4 chambers view and Sa tricuspid annulus in TTE (Rho = 0.63; P < 0.0001). Assessing RV function by systematic multiparametric TTE strategy had a 50% sensibility and a 89.7% specificity to predict RVEF less than 35% in cardiac 64-MSCT scan with a 94.59% negative predictive value.

Conclusion.— We showed that TTE parameters used to assess RV function had good correlations with modern parameters derived from a standard 64-MSCT cardiac scan. A systematic multiparametric strategy in TTE had a high negative predictive value of RV dysfunction assessed by 64-MSCT cardiac scan. The prognostic value of such a strategy should be evaluated in prospective studies in different clinical issues like risk stratification before cardiac adult surgery or after a pulmonary embolism.

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Echocardiographic assessment of the right ventricle during inferior myocardial infarction

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Objectives.— The right ventricle infarction (RVI) may complicate 40 to 50% of inferior myocardial infarction. The purpose of this study was to evaluate the contribution of echocardiography to detect right ventricle ischemia during an inferior myocardial infarction.

Patients and methods.— This is a prospective study including all patients hospitalized for a first inferior myocardial infarction (P group) between January 2010 and November 2010. A right ventricle infarction was defined by an ST elevation of 1 mm or more in right leads (V3R, V4R). All patients underwent Doppler echocardiography during the first 48 hours and were compared to healthy subjects (S group).

Results.— The average age of our patients was 59.94 ± 13 years with a male predominance. Ten patients had electrical extension to the right ventricle (32.25%). The echocardiographic study of right ventricular function showed a significantly lower systolic function in patients than in healthy subjects (right ventricle ejection fraction: P group = 51.13%, S group = 66%, P < 0.001). The movement of the tricuspid annulus TAPSE was significantly lower in patients than healthy subjects (P group = 16.24 mm, S group = 21.32 mm, P < 0.001). Among patients, the TAPSE was significantly lower in case of RVI (RV+ = 12.22; RV– = 18.16, P < 0.001). Similarly, the systolic wave velocity at lateral wall of the tricuspid annulus was significantly reduced in patients compared to healthy subjects (P group = 12.13 cm/s, S group = 17.56 cm/s, P = 0.05), and was even lower in patients with RVI compared to the others patients (RV+ = 11.87 cm/s; RV– = 13.5 cm/s, P < 0.001).

Conclusion.— Our study demonstrates that the TAPSE and the systolic wave velocity at tricuspid annulus are simple methods for the early diagnosis of right ventricle ischemia during an inferior.

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Importance of challenging right side ventriculo-arterial interactions in advanced heart failure patients


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Objectives.— Pulmonary hypertension (PH) and right ventricular (RV) systolic dysfunction are two prognostic factors in advanced heart failure (AdHF). RV and pulmonary artery coupling is one of the main determinants of global RV systolic function. Assessment of PH reversibility is routinely performed and uses different pharmacological protocols. Conversely, RV contractile reserve response during such pharmacological challenges has not been described. Our study compared RV contractile reserve during isolated inhaled nitric oxide (iNO) challenge or comprehensive pharmacological test with diuretics, nitrates and positive inotropes in AdHF patients (pts) addressed for PH reversibility testing.

Methods.— All AdHF pts addressed in our institution for PH reversibility testing from November, 2009 till July, 2010 were screened. We included after informed consent every pts with a mean pulmonary arterial pressure (PAP) ≥ 25 mmHg. iNO testing was performed after basal measurements, followed by a comprehensive pharmacological test after 15 minutes of wash-out. RV systolic function was assessed at each step from transthoracic echocardiography with TAPSE and the maximal velocity of the systolic wave of tricuspid annulus in tissue doppler (Sa). Contractile reserve was defined as the difference between post-test TAPSE or Sa and basal or post-wash out TAPSE or Sa (ΔTAPSE, ΔSa).

Results.— Nineteen pts were included. Mean left ventricular ejection fraction was 22 ± 3%. Mean PAP was 40 ± 6 mmHg; pulmonary vascular resistances (PVR) were 4 ± 2 Wood Units. TAPSE was 14 ± 5 mm, Sa was 10 ± 3 cm/s. iNO had no significant effect on both PAP and PVR, and RV systolic function. Comprehensive pharmacological testing showed a significant decrease in mean PAP (−38.1%, P < 0.001), PVR (−39.6%, P < 0.03), and a significant RV contractile reserve (TAPSE: +22%, P < 0.004; Sa: +12%, P < 0.03). In a subgroup of 11 pts with basal Sa < 10 cm/s, PAP and PVR at baseline were not different from the whole population of the study, and iNO did not reverse PH but led to a significant RV contractile reserve (ΔTAPSE: +2.5 ± 2 mm; ΔSa: +1 ± 0.05 cm/s). ΔSa with iNO was correlated with Δsystolic PAP (r = −0.619, P < 0.04) and Δtransmural pressure gradient (r = −0.533, P < 0.05).

Conclusion.— As previously described by our team, isolated iNO challenge fails to prove PH reversibility in AdHF pts. However, iNO induces a significant RV contractile reserve in pts with the more altered RV, which is correlated to PAP and PVR decrease. These findings underline the importance of targeting ventriculo-arterial interaction in RV failure in AdHF, particularly in the more severe pts.

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Assessing right ventricular systolic function in a population of unselected patients before cardiac surgery: A multiparametric approach is mandatory


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Background and aim.— Assessment of right ventricular (RV) function is of prognostic value in patients undergoing cardiac surgery. In recent American guidelines, 2 definitions for the diagnosis of RV dysfunction are validated: (1) peak systolic velocity during ejection period (Sa) < 10 cm/s (2) RV fractional shortening (RVFS) < 35%. The aim of our study was to assess these recent recommendations in a large non-selected cohort of patients awaiting cardiac surgery.

Methods.— Two hundred and sixty seven patients (means values of age [73 ± 14] years) underwent TAPSE and the maximal velocity of the systolic wave of tricuspid annulus in tissue doppler (Sa). TAPSE was defined as the difference between post-test TAPSE or Sa and basal or post-wash out TAPSE or Sa (ΔTAPSE, ΔSa). TAPSE was a significant lower in case of RVI (RV+ = 12.22; RV– = 18.16, P < 0.001). Similarly, the systolic wave velocity at lateral wall of the tricuspid annulus was significantly reduced in patients compared to healthy subjects (P group = 12.13 cm/s, S group = 17.56 cm/s, P = 0.05), and was even lower in patients with RVI compared to the others patients (RV+ = 11.87 cm/s; RV– = 13.5 cm/s, P < 0.001).

Conclusion.— Our study demonstrates that the TAPSE and the systolic wave velocity at tricuspid annulus are simple methods for the early diagnosis of right ventricle ischemia during an inferior.