**Abstract: 6067**

**Right ventricular global longitudinal strain predicts cardiovascular mortality and heart failure hospitalization in patients with functional tricuspid regurgitation**

**Authors:**
R. Ochoa-Jimenez¹, A.C. Guta², M. Previtero³, C. Palermo³, P. Aruta³, L.P. Badano³, D. Muraru³, ¹Department of Cardiac, Thoracic and Vascular Sciences, University of Padua, Italy, Internal Medicine Department, Mount Sinai St Luke and Mount Sinai West - New York - United States of America, ²Department of Cardiac, Thoracic and Vascular Sciences, University of Padua, Italy, Carol Davila University of Medicine and Pharmacy - Bucharest - Romania, ³University of Padova, Department of Cardiac, Thoracic and Vascular Sciences - Padua - Italy,

**Topic(s):**
Echocardiography: Valve Disease

**Citation:**
European Heart Journal (2019) 40 (Supplement), 3705

**Background:** Functional tricuspid regurgitation (FTR) and its increasing severity are well-known factors associated with increased morbidity and mortality in patients with pulmonary artery hypertension or left heart diseases.

**Purpose:** To assess the main clinical and echocardiographic determinants of outcome in patients with various causes of FTR.

**Methods:** A total of 140 patients (pts) (72±14 years, 40% men) with FTR of diverse etiologies underwent complete 2D and additional 3D echocardiography acquisitions and were followed for a median of 5.2 years (interquartile range 2.1 - 6.7 years). Severe FTR was defined by ≥2 parameters: (1) coaptation defect; (2) vena contract ≥7; (3) PISA radius >9 mm; (4) hepatic vein systolic flow reversal. The primary composite outcome was defined as death from cardiovascular causes and hospitalization due to right-sided heart failure (HF).

**Results:** 74 pts (53%) developed the primary composite outcome. Death occurred in 31 pts (22%), while hospitalization due to right-sided HF occurred in 66 pts (47%). At baseline, patients who developed the primary composite outcome, compared to those who did not, had more symptoms, more severe FTR, higher pulmonary systolic pressure (60±27 vs 43±16 mmHg), larger right atrium (69±34 vs 51±22 mL/mm²), right ventricular (RV) basal diameter (29±6 vs 24±4 mm/m²), larger RV end-diastolic (102±45 vs 76±25 mL/m²) and end-systolic (62±37 vs 43±17 mL/m²) volumes, larger tricuspid annulus area (7.7±1.8 vs 6.8±1.8 cm²/m²), lower RV systolic function (RVEF [42±11 vs 46±8%], TAPSE [18±4 vs 21±4], S' [11±3 vs 12±2], RV global longitudinal strain (RVGLS) [16±5 vs 19±4], RV free wall longitudinal strain [19±7 vs 23.5]); all p-values <0.03. There were no significant differences in age, body size or comorbidities. After multivariable Cox regression analysis, FTR grade severity (hazard ratio [HR]=2.95, 95% confidence interval [CI] 2.14–4.06, p<0.001) and RVGLS (HR= 0.91, 95% CI 0.86–0.95) were the only independent predictors of mortality. A cutoff of −17.5 for RVGLS had 57% sensitivity, 73% specificity and a HR of 2.34 (95% CI of 1.42–3.88, p-value=0.001). The Kaplan Meier survival curve showed that patients with an RVGLS ≥−17.5 had a higher probability of developing the primary composite outcome, especially at an earlier phase of the follow up when compared to those with higher LS (log rank test chi-square = 13.0, p<0.001) (Figure). At the end of follow up, 60% of patients with a RVGLS ≥17.5 did not developed the primary composite outcome vs 29% in the group with a LS lower than −17.5.

**Conclusions:** In patients with FTR, a decreased RVGLS, with a cutoff of −17.5, proved to be an independent prognostic factor for the development of HF hospitalizations and death from cardiovascular causes.
Right ventricular global longitudinal strain predicts cardiovascular mortality and heart failure hospitalization in patients with functional tricuspid regurgitation.

Authors:

Department of Cardiac, Thoracic and Vascular Sciences, University of Padua, Italy, Internal Medicine Department, Mount Sinai St Luke and Mount Sinai West - New York - United States of America,
Department of Cardiac, Thoracic and Vascular Sciences, University of Padua, Italy, Carol Davila University of Medicine and Pharmacy - Bucharest - Romania,
University of Padova, Department of Cardiac, Thoracic and Vascular Sciences - Padua - Italy

Topic(s):
Echocardiography: Valve Disease

Citation:
European Heart Journal (2019) 40 (Supplement), 3705

Background:
Functional tricuspid regurgitation (FTR) and its increasing severity are well-known factors associated with increased morbidity and mortality in patients with pulmonary artery hypertension or left heart diseases.

Purpose:
To assess the main clinical and echocardiographic determinants of outcome in patients with various causes of FTR.

Methods:
A total of 140 patients (pts) (72±14 years, 40% men) with FTR of diverse etiologies underwent complete 2D and additional 3D echocardiography acquisitions and were followed for a median of 5.2 years (interquartile range 2.1–6.7 years). Severe FTR was defined by ≥2 parameters: (1) coaptation defect; (2) vena contract ≥7; (3) PISA radius >9 mm; (4) hepatic vein systolic flow reversal. The primary composite outcome was defined as death from cardiovascular causes and hospitalization due to right-sided heart failure (HF).

Results:
74 pts (53%) developed the primary composite outcome. Death occurred in 31 pts (22%), while hospitalization due to right-sided HF occurred in 66 pts (47%). At baseline, patients who developed the primary composite outcome, compared to those who did not, had more symptoms, more severe FTR, higher pulmonary systolic pressure (60±27 vs 43±16 mmHg), larger right atrium (69±34 vs 51±22 mL/mm²), right ventricular (RV) basal diameter (29±6 vs 24±4 mm), larger RV end-diastolic (102±45 vs 76±25 mL/mm²) and end-systolic (62±37 vs 43±17 mL/mm²) volumes, larger tricuspid annulus area (7.7±1.8 vs 6.8±1.8 cm²/mm²), lower RV systolic function (RVEF [42±11 vs 46±8%], TAPSE [18±4 vs 21±4], S' [11±3 vs 12±2], RV global longitudinal strain (RVGLS) [16±5 vs 19±4]; all p-values <0.03. There were no significant differences in age, body size or comorbidities. After multivariable Cox regression analysis, FTR grade severity (hazard ratio [HR]=2.95, 95% confidence interval [CI] 2.14–4.06, p<0.001) and RVGLS (HR=0.91, 95% CI 0.86–0.95) were the only independent predictors of mortality. A cutoff of −17.5 for RVGLS had 57% sensitivity, 73% specificity and a HR of 2.34 (95% CI of 1.42–3.88, p-value=0.001). The Kaplan Meier survival curve showed that patients with an RVGLS ≥−17.5 had a higher probability of developing the primary composite outcome, especially at an earlier phase of the follow up when compared to those with higher LS (log rank test chi-square = 13.0, p<0.001) (Figure). At the end of follow up, 60% of patients with a RVGLS ≥−17.5 did not develop the primary composite outcome vs 29% in the group with a LS lower than −17.5.

Conclusions:
In patients with FTR, a decreased RVGLS, with a cutoff of −17.5, proved to be an independent prognostic factor for the development of HF hospitalizations and death from cardiovascular causes.

Kaplan-Meier curve of outcome by RVGLS

<table>
<thead>
<tr>
<th>Number at risk</th>
<th>Follow-up (months)</th>
<th>RVGLS≤ -17.5</th>
<th>RVGLS&gt; -17.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>100</td>
<td>41</td>
<td>15</td>
</tr>
<tr>
<td>51</td>
<td>100</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>90</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>70</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>