Right ventricular-pulmonary arterial coupling for predicting death or heart failure admission in a broad population of patients with severe tricuspid regurgitation: data from the INTRICOR registry

M. Ruiz Ortiz¹, C. Fernandez Aviles¹, A. Fernandez Ruiz¹, M. Delgado Ortega¹, D. Mesa Rubio¹, A. Rodriguez Almodovar¹, F. Esteban Martinez², G. Heredia Campos¹, A. Resua Collazo¹, L.C. Maestre Luque¹, M. Diaz Andrade¹, A. Nistor¹, J. Herrera Flores¹, A. Torres Zamudio¹, M. Pan Alvarez-Ossorio¹

¹Cardiology Department. University Hospital Reina Sofia, Cordoba, Spain

Funding Acknowledgements: Type of funding sources: Foundation. Main funding source(s): Andalusian Society of Cardiology

Background: The role of right ventricular-pulmonary arterial coupling, non-invasively evaluated by means of the tricuspid annular plane systolic excursion (TAPSE) and pulmonary artery systolic pressure (PASP) ratio in prognostic assessment of tricuspid regurgitation (TR) has been studied only in selected populations and mainly for all-cause mortality.

Purpose: To investigate the value of TAPSE/PASP ratio for predicting the combined end-point of mortality and heart failure (HF) admission in follow-up in a broad population of patients with severe TR, and to compare its discriminative ability with both components of the index separately.

Methods: We included retrospectively all consecutive patients ≥18 years with severe TR studied with echocardiography in a tertiary care hospital from 01.01.2008 to 31.12.2017, followed up to 01.01.2022. Association of TAPSE/PASP ratio with the combined end point and comparative discrimination ability with both components of the index was investigated. The net reclassification indexes for events (NRIne) and non-events (NRIne) were also calculated, with variables dichotomized at median values for establishing risk groups.

Results: A total 661 patients (69±13 years, 72% women) with severe TR, followed for up to 14 years (median 5 years, p25-75 2-7 years) were included in the cohort, with 384 deaths and 268 patients with 636 HF admissions on follow up. Median (p25-75) values for TAPSE/PASP, TAPSE and PASP were 0.34 (0.25-0.44) mm/mmHg, 18 (16-20) mm and 53 (43-65) mmHg, respectively. All three variables were associated with the combined outcome in univariate analysis (figure 1). Discriminative abilities for predicting the endpoint (figure 2A) were statistically significant for all, but TAPSE/PASP performed significantly better than both components separately (p<0.0005). However, after adjusting by other statistically significant prognostic variables, TAPSE/PSAP was not found to be an independent predictor (HR 0.711 [0.091-5.555], p=0.75), whereas both components of the index remained in the model (HR 0.945 [0.919-0.972], p<0.0005 for TAPSE and HR 1.012 [1.007-1.018], p<0.0005 for PASP). The discriminative performance of the three multivariate models including each variable was statistically significant for all, but TAPSE/PASP performed significantly better than both components separately (p<0.0005). However, after adjusting by other statistically significant prognostic variables, TAPSE/PSAP was not found to be an independent predictor (HR 0.711 [0.091-5.555], p=0.75), whereas both components of the index remained in the model (HR 0.945 [0.919-0.972], p<0.0005 for TAPSE and HR 1.012 [1.007-1.018], p<0.0005 for PASP). The discriminative performance of the three multivariate models including each variable was statistically significant for all (figure 1B) but the model including TAPSE/PASP performed similarly to the one including TAPSE (p=0.86) and worse than the one including PASP (p=0.02). The NRIne and NRIne for TAPSE/PASP versus TAPSE were 5.0% and 0.5%; and 0.4% and 1.3% versus PASP; these values for multivariate models including TAPSE/PSAP versus TAPSE were 3.1% and 0.4%; and 3.6% and 1.6% versus PASP.

Conclusions: In this broad sample of patients with severe TR, TAPSE/PASP ratio was associated with HF admission or mortality in univariate analysis, and its discriminative ability was higher than any of both components of the index. However, it was not an independent predictor in multivariate analysis.
ROC curves