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**INVITED EDITORIAL**
*Valvular heart disease*

# A new score to stratify the risk in tricuspid regurgitation: the icing on the cake

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**This editorial refers to 'A validated score to predict 1-year and long-term mortality in patients with significant tricuspid regurgitation', by A. Hochstadt *et al*., https://doi.org/10.1093/ehjopen/oeac067.**

It has long been the forgotten valve. The tricuspid valve and its regurgitation (TR) are increasingly recognized and understood.[1] Tricuspid regurgitation is primarily a secondary (functional) valvular regurgitation. It is mainly associated with right ventricular (RV) remodelling related to increased afterload and/or predominant right atrial dilatation.

Up the recent year, there was, so to speak, no well-defined and accepted treatment for TR. Surgery has not been widely used and published series have shown that in severe or overly severe patients, tricuspid valve surgery was associated with an unacceptable 30-day outcome.[2] Percutaneous tricuspid valve repair and replacement have become possible and prospective randomized studies are currently ongoing.[3] No strong prognostic data are currently available, but the results of retrospective series and feasibility studies are promising.[4,5]

Knowing the best indications and identifying the right procedure for the right candidate for correcting functional TR will likely be a challenge. The Tri-score derived from a surgical population showed us that the prognosis of TR patients was poor and that it could be estimated based on age ≥70 years, New York Heart Association Class III and IV, right-sided heart failure signs, daily dose of furosemide ≥125 mg, glomerular filtration rate <30 mL/min, elevated bilirubin, left ventricular ejection fraction <60%, and moderate/severe RV dysfunction.[6] The present work by Hochstadt *et al*.[7] has to be highlighted as well and complements the Tri-score in a cohort of 1701 patients with significant TR treated conservatively. The mortality rate at 1 year was high and reached 31.3%.

First, the authors created a score which they then validated on an external population of 5141 patients.[7] The risk score consisted of 11 parameters: age (0–3), body mass index ≤25 (0–1), history of liver disease (0–2), history of chronic lung disease (0–2), estimated glomerular filtration rate (0–5), haemoglobin (0–2), left ventricular ejection fraction (0–1), RV dysfunction (0–1), right atrial pressure (0–2), stroke volume index (0–1), and left ventricular end-diastolic diameter (0–1). In practice, the orientation of a patient towards a surgical or percutaneous option cannot be based on a simple and clear-cut decision-making process; at all costs, it involves a multidisciplinary approach.

The liver should be explored carefully, and the cardio-renal syndrome should be explored and controlled as much as possible.[8]

The stroke volume has also been underlined by Hochstadt *et al*. It has already been suggested and is probably important never to forget this independent prognostic value of this parameter which has been emphasized for the aortic valve stenosis but which should be reported and used in the decision-making process for all valvular heart disease.[9]

The right heart dysfunction is one of the main points to examine, although the how remains to be defined. Indeed, RV unloading due to TR makes it difficult to estimate RV function. In the study of Hochstadt *et al*., RV function was assessed by tricuspid annular plane systolic excursion (TAPSE) or systolic tricuspid lateral annular velocity (RV *s'*) measured in the apical four-chamber view. However, these parameters are load-dependent and have many drawbacks. Currently, several authors have proposed the use of myocardial deformation (strain imaging), especially if corrected for the afterload (systolic pulmonary arterial pressure, sPAP) to obtain myocardial work.[10] Unlike the ratio TAPSE/sPAP which has been widely used in heart failure, validation studies in TR are still needed.[11] This ratio testing the coupling between the pulmonary arteries and the RV seems easy to measure and very valuable. In a recent prospective multicentre study, it was shown that, in association with the right atrial size, a cut-off of 0.4 mm/mmHg predicted the risk of an event in patients with severe functional TR. More prospective and large cohorts should be explored to better understand how to ideally characterize the RV function in patients with TR and, as we do for left heart valvular disease, use these RV parameters to best select patients for intervention.

Characterizing the prognosis of patients with TR under conservative management vs. after an intervention are two different things. Hochstadt *et al*.[7] discussed this very nicely in their manuscript. They also pointed out that their score could be combined with the Tri-score to help decide whether or not to offer an intervention to a specific patient.[6] It is an important and difficult task and these scores or perhaps the clustering based on 'sophisticated' statistical approach could be extremely valuable for this TR population.

Symptoms of TR are vague and progress slowly. Patients start to complain mainly of asthenia and exercise-induced dyspnoea. In front of such unspecific symptoms and in the presence of significant TR, the cardiologist should know that a precise and complete evaluation of the 11 parameters of the score should (at least) be evaluated.[12]

The opinions expressed in this article are not necessarily those of the Editors of the *European Heart Journal Open* or of the European Society of Cardiology.

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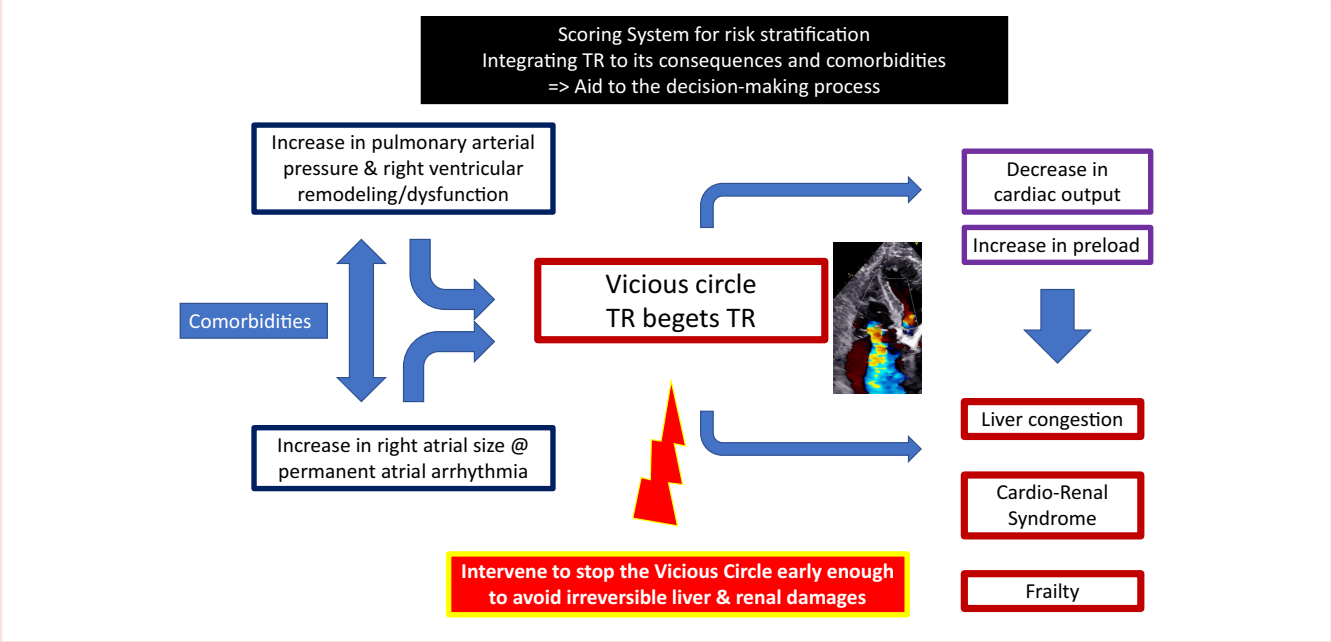


**Figure 1** Summary of the needs for considering the tricuspid regurgitation and the surroundings for best defining the timing for potential intervention. Value of the score integrating most of these parameters.

Our community should not wait for extreme symptoms and signs of right heart failure to discuss the potential need for intervention (*Figure 1*). There is a critical need to accurately predict individual mortality rates with conservative treatment to support individual decisions regarding the timing of surgery or transcatheter intervention.[7] There is also a huge need to inform our medical community that the tricuspid valve should not be overlooked as it used to be the case.

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