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Index of Suspicion: Predictors of Tricuspid Regurgitation Progression and Follow-up Echo Imaging in An Artificial-intelligence Enhanced Study
Tricuspid regurgitation (TR) is associated with negative outcomes.

There are few data on factors influencing TR progression and patient follow-up after TR is discovered.
Methods

► A retrospective cohort study of patients with less than severe TR was conducted from August 2018 to December 2021 to identify predictors of

1) disease progression to severe TR, and

2) presence of follow up echo.

► Patients were followed up from their first (index) echo with TR up until June 2023. Data were collected using Tempus Next (Tempus Labs Inc, Chicago, IL).

► Demographic and Echo indices were parsed from the Echo report using natural language processing.

► Multivariate Cox proportional-hazards model examined the association between predictors and disease progression. Logistic regression examined predictors of undergoing a follow-up echo. Both analyses controlled for index disease severity.
Results

► 33,108 patients with TR (27,107 mild, 2,517 mild-moderate, 2,851 moderate, 633 moderate-severe) were included in the study (min / max / average observation times: 521 / 1,769 / 1,060 days).

► 10,696 (32%) had a follow up echo that allowed us to assess disease progression (average time to follow up 570 days; range: 31-1,743 days).

► 306 (2.9% of 10,696) eventually progressed to severe TR.
Progression to severe TR was dependent on the index TR severity (0.3% mild; 1.9% mild-moderate; 4.2% moderate; 10% moderate-severe).

However, when controlling for index TR severity, RVSP, RAP, and age, females had a 1.6x (95% CI HR 1.21-2.09) higher risk of progressing to severe TR.
When controlling for other variables, an increased severity at index did not result in higher odds of a follow-up echo (moderate-severe vs mild TR, OR=1.03, p=0.78).

Females were 20% less likely to receive a follow up echo (95% CI OR 0.78-0.89).

LVEF ≤ 35% (95% CI OR 1.24-1.54), ≥ moderate MR (95% CI OR 1.20-1.54), and ≥ moderate AS (95% CI 2.32-2.52) resulted in higher odds of receiving a follow-up echo.
Conclusions

► These findings highlight the importance of comprehensive risk assessment.

► These findings raise concerns about under-recognition of the importance of TR follow-up and potential sex disparities in TR management and follow-up.