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Mortality from Aortic Stenosis Across the Spectrum of Severity: Analysis of Big Data from the National Echo Database of Australia (NEDA)

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Background: Echocardiography (echo) is pivotal in evaluation of aortic valve gradients. We evaluated prognostic implications of the full spectrum of aortic stenosis severity in a large patient cohort, matched with mortality data. Methods: NEDA is a vendor-agnostic cloud-based database, containing echo measurement data (1997 - 2017) from laboratories across Australia (N=10) across Australia (currently >550,000 Echos). Data linkage to the National Death Index (NDI) provided survival status on each individual from the last TTE date of entry to 2017, or until censored date in October 2017. Data were available from 352,844 individuals comprising 186,820 men (60.8±18.0 yrs) and 166,024 women (60.9±19.2 yrs) with a mean follow up of 5.4 years per person and 63,142 fatal events. Results: Overall, a peak aortic valve velocity (AVvel) was recorded in 278,955 patients, demonstrating a J-shaped mortality relationship. The association between LVEF and a composite of death, stroke, and rehospitalization at 1 year was significant (OR = 0.97; 95% CI 0.97-0.98; p < 0.0001) when compared to men. Medicaid patients were also less likely to receive appropriate TTE surveillance than white patients, with an odds ratio (OR) of 0.74 (95% CI 0.66-0.83; p < 0.0001), as were women OR 0.90 (95% CI 0.86-0.95; p < 0.0001) compared to men. Medicaid patients were also less likely to receive appropriate TTE surveillance than Medicare patients OR 0.85; 0.75-0.96; p = 0.0095). In addition, older patients were also significantly less likely to receive appropriate TTE surveillance when compared to younger patients with OR 0.45 (95% CI 0.31-0.66; p < 0.0001) for those 61-70 years old, OR 0.39 (95% CI 0.26-0.57; p < 0.0001) for those 71-80 years old, and OR 0.31 (95% CI 0.21-0.51; p < 0.0001) for those 81-90 years old compared to those 18-20 years old. Conclusions: Older, black, female patients, as well as patients on Medicaid, are less likely to receive appropriate TTE surveillance for valvular disease. These results provide targets for care improvement strategies and suggest the need for further investigation into the clinical consequences of delayed surveillance for specific sociodemographic groups.

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The Association of Echocardiographic Surveillance of Valvular Heart Disease with Different Sociodemographic Groups

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Background: Clinical outcomes of patients with valvular heart disease vary across sociodemographic groups. Differences in frequency of trans-thoracic echocardiogram (TTE) surveillance may contribute to differences in clinical outcomes. We hypothesized that sociodemographic factors were associated with appropriately timed surveillance imaging for aortic stenosis (AS), mitral regurgitation (MR), and aortic insufficiency (AI).

Methods: We linked records of all TTEs from 2001-2016 ordered at a large echocardiographic laboratory to demographic patient data and selected patients who were likely to have had TTEs performed for surveillance of AS, AI, or MR. Time intervals were calculated between sequential TTEs for a given patient, and the binary outcome variable was defined as receipt of a TTE within the guideline-recommended interval for the most severe valve disease noted in the index TTE. Logistic regression was used to determine the association of race/ethnicity, gender, and insurance status with the likelihood of receiving a TTE within the appropriate interval.

Results: Our study cohort comprised 130,725 TTEs, representing 42,289 unique patients. Non-Hispanic black patients were significantly less likely to receive appropriate TTE surveillance than white patients, with an odds ratio (OR) of 0.74 (95% CI 0.66-0.83; p < 0.0001), as were women OR 0.90 (95% CI 0.86-0.95; p < 0.0001) compared to men. Medicaid patients were also less likely to receive appropriate TTE surveillance than Medicare patients OR 0.85; 0.75-0.96; p = 0.0095). In addition, older patients were also significantly less likely to receive appropriate TTE surveillance when compared to younger patients with OR 0.45 (95% CI 0.31-0.66; p < 0.0001) for those 61-70 years old, OR 0.39 (95% CI 0.26-0.57; p < 0.0001) for those 71-80 years old, and OR 0.31 (95% CI 0.21-0.51; p < 0.0001) for those 81-90 years old compared to those 18-20 years old. Conclusion: Older, black, female patients, as well as patients on Medicaid, are less likely to receive appropriate TTE surveillance for valvular disease. These results provide targets for care improvement strategies and suggest the need for further investigation into the clinical consequences of delayed surveillance for specific sociodemographic groups.

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Flow Reversal in the Aorta in the Absence of Aortic Regurgitation in Patients Undergoing TAVR

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Background: Flow reversal in the descending thoracic aorta (DTA) is incorporated into both American Society of Echocardiography (ASE) and European Association of Echocardiography (EAE) guidelines for the echocardiographic assessment of native valve aortic regurgitation (AR). Prominent holodiastolic aortic regurgitation (AR) or holodiastolic flow reversal with an end-diastolic velocity ≥ 20 cm/s (EAE) support the diagnosis of severe AR as does flow reversal in the abdominal aorta (AaO). These approaches have been extrapolated to the assessment of AR in elderly patients undergoing transcatheter aortic valve replacement (TAVR). Although guidelines recognize that reduced aortic compliance may limit the specificity of these findings, we hypothesized that aortic flow reversal may be false positively present in patients undergoing TAVR in the absence of AR, impacting its use in assessing post TAVR AR. Methods: We prospectively evaluated the prevalence and degree of flow reversal in the DTA and AaO in 101 consecutive pts (71 following exclusions for inadequate DTA flow signal) with severe aortic stenosis and no more than...