**A composite echocardiography score for non-invasive rejection prediction in the acute post-transplant period**

**Background**: Cardiac allograft rejection remains a frequent complication in heart transplant recipients. Non-invasive imaging with transthoracic echocardiography (TTE) enables a comprehensive assessment of heart structure and function and may reduce the need for invasive endomyocardial biopsy for diagnosis and grading. We sought to use routinely collected TTE information to identify who would go on to experience rejection.

**Method**: Routine 2D TTE was performed within 3 weeks of transplant (17/NTB/46). Principal component (PC) analysis was performed on measurements of E/E’ (lat), MV Dec. Slope, and IVSd, to identify the underlying clinical patterns relevant to rejection and develop a score. Moderate rejection was defined as ISHLT Acute Cellular Rejection Grade 2R.

**Results**: In the cohort of 30 recipients (age 50.6 [SD 11.6] years, 7 females), 13/30 (43%) developed moderate rejection within the 12 weeks following their echocardiographic assessment. The first 2 PCs explained 100% of the variation and adding them gave a composite score of 0.063E/E’ + 1.071Dec. Slope - 0.921IVSd. Application of this score showed clear discrimination between those that developed 2R compared with those that did not; an unpaired t-test revealed a statistically significant (p=0.0008) difference in scores between the two groups.

**Conclusion**: An objective summary score has been developed using two markers of diastolic function and a geometric marker indicating overall ventricular status. Although validation in a larger sample of patients is required, these findings suggest there is potential utility of echocardiography to predict moderate rejection, which may ultimately reduce the number of biopsies required in the post-transplant period.