the highest risk of poor memory (OR = 1.10, 95% CI: 1.01; 1.10), and comorbidity of heart disease (OR = 1.11, 95% CI: 1.06; 1.16).

These associations can inform preventive measures regarding healthy food choices. Understanding the impact of food choices on older people is essential to inform what can protect or contribute to memory loss and comorbidity of heart disease within the older population.

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Heart Failure Prize Finalists (023–026)

023

A Novel Method for Deriving Pressure-Volume Loops in Stable cfLVAD Patients: Validation and Insights into Myocardial Oxygen Consumption, Energetics and Efficiency

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Introduction: Assessment of left ventricular (LV) recovery under continuous-flow left ventricular assist device (cfLVAD) support is hampered by concomitant pump support. We describe derivation of non-invasive pressure-volume (PV) loops in cfLVAD patients and demonstrate an application in the assessment of recovery.

Methods: Using controller parameters and non-invasive arterial pressure waveforms, central aortic pressure, outflow conduit pressure gradient and instantaneous left ventricular pressure (LVP) were calculated. Instantaneous LV volumes (LVV) were calculated from echocardiographic left ventricular end-diastolic volume (LVEDV) accounting for the integral of pump flow with respect to time and aortic ejection volume derived from the pump speed waveform. PV loops were derived during pump speed adjustment and following bolus intravenous Milrinone to assess changes in loading conditions and contractility respectively.

Results: Fourteen patients were studied, generating 77 non-invasive PV loops. Baseline non-invasive LV EDP (90.3 ± 13.6 vs 36 ± 14.2%, p < 0.0001), maximum dP/dt (623 ± 126 vs 555 ± 122 mmHg/s, p = 0.06), and end-systolic elastance (1.03 ± 0.57 vs 0.89 ± 0.38 mmHg/mL, p = 0.008), consistent with its expected inotropic effect. Milrinone reduced MVO2 (0.16 ± 0.07 vs 0.14 ± 0.06 mL/beat, p = 0.003) and improved myocardial efficiency (43.7 ± 14.0 vs 41.2 ± 15.5, p = 0.003). Reduced pump speed caused increased LVEDV (190.8 ± 80 vs 165 ± 71 mmHg, p = 0.0001) and LVEDP (14.3 ± 10.2 vs 9.9 ± 9.3 mmHg, p = 0.024), consistent with a predictable increase in preload. There was increased MVO2 (0.16 ± 0.07 vs 0.14 ± 0.06 mL/beat, p < 0.0001) despite unchanged stroke work (p = 0.24), reflecting decreased myocardial efficiency (39.2 ± 12.7 vs 45.2 ± 17.0%, p = 0.003).

Conclusions: Non-invasive PV loops can accurately detect changes in load and contractility, and may help detect LV recovery under cfLVAD support.

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024

Cognitive Domains and Post-Discharge Outcomes in Hospitalised Patients With Heart Failure

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Background: Cognitive impairment (CI) is an independent marker of readmission in heart failure (HF), but the screening is time-consuming. This study sought (1) to identify HF patients at low risk of cognitive impairment (obviating screening) and (2) to simplify a predictive model of HF outcomes by only using cognitive domains that are most predictive.

Methods: Montreal Cognitive Assessment (MoCA) was performed in 1152 Australian HF patients who were followed for 12 months. One third (376/1152) of the patients were enrolled into an HF disease management plan (HF-DMP) to reduce early readmission. Post-discharge outcomes in HF included 30- and 90-day readmission or death, and days alive-and-out-of-hospital within 12 months of discharge.

Results: Cognitive impairment – present in 54% of patients – independently predicted HF outcomes. Normal cognition could be predicted with common clinical and sociodemographic factors with good discrimination (C-statistic = 0.74 [0.69–0.78]). The Visuospatial/Executive and Orientation domains were most predictive of HF post-discharge outcomes. Using either MoCA score or these two domains provided similar incremental values (p = 0.004 and p = 0.008 respectively) in predicting HF outcomes (both C-statistic = 0.76), and could similarly identify a group of high-risk patients who benefited most from an HF-DMP.

Conclusions: Cognitive function independently predicts HF outcomes, and may also contribute to how a patient responds to intervention. The time and resources spent on cognitive assessment for risk-stratification in HF may be minimised by (1) identifying patients with low risk of cognitive impairment and (2) simplifying the screening instrument to include only the domains that are most predictive of post-discharge outcomes in HF.

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