

9 Cardio-Omentopexy to Reduce Myocardial Scarring and Promote Regeneration

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OBJECTIVES/GOALS: While the current management of single ventricle repairs has drastically prolonged life expectancy, the repair fails over time primarily through pathologic inflammation and fibrosis. Our goal is to demonstrate that cardio-omentopexy can decrease inflammation and fibrosis in swine after cryoinjury. **METHODS/STUDY POPULATION:** A cryoinjury is created using a liquid nitrogen cooled probe to the right ventricle of 20kg swine. In half the groups the omentum is attached to the heart over the area of the injury. The swine are recovered and monitored for 4 or 8 weeks at which time they are euthanized. The injured area is evaluated via histological and immunohistochemical testing for markers of inflammation and scarring including collagen type, scar area, macrophage activity. **RESULTS/ANTICIPATED RESULTS:** We anticipate that the addition of omentopexy to cryoinjury will decrease scar area, fibrosis and markers of chronic inflammation. Additionally, we expect an increase in myocytes in the area of injury. We expect that this will occur through the anti-inflammatory and protective mechanism of the omentum. **DISCUSSION/SIGNIFICANCE:** Cardio-omentopexy, if able to decrease fibrosis and preserve myocytes, may provide a useful adjunct to the treatment of single ventricle repair by prolonging the longevity of the repair. Additionally, as these repairs often require a ventriculotomy, decreasing the operative scar may preserve myocardial function.

10 Chronic cadmium exposure is associated with Alzheimer's Disease-related mortality in adults over age 60 in a representative US sample

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OBJECTIVES/GOALS: Cadmium is a widespread neurotoxic metal pollutant; however prior study results of Cd and later-life cognition are mixed. We investigated association of urinary cadmium on Alzheimer's Disease (AD) mortality risk, accounting for key co-pollutants smoking and lead, in the presence of competing risks. **METHODS/STUDY POPULATION:** We included 5692 persons, 60 years old from the 1998-2018 National Health and Nutrition Examination Survey. Underlying cause of death was determined via linked 1999-2019 National Death Index data. Urinary cadmium (UCD) reflects prolonged exposure and was adjusted for creatinine. We used multiple imputation (5 iterations) to recapture substantial model observation drop-out (N=782). We used three Cox proportional hazard models to estimate hazard ratios (HR) and 95% confidence interval (CI) per unit increase in UCD and time to AD mortality: a competing risks model, a survey-weighted model, and a baseline model including neither, all adjusted for demographic characteristics, lead, and smoking. **RESULTS/ANTICIPATED RESULTS:** Follow-up ranged from 0 to 20.8 years (mean 8.2 years), with a total of 1,987 individuals deceased (14,232 person-years at-risk), including 88 individuals

dying from AD. Mean UCD was 0.50 µg/g creatinine (standard error=0.01). In baseline and survey-weighted models fully adjusted for NHANES cycle, poverty income ratio, age, race/ethnicity, sex, marital status, education, smoking status, and blood lead levels, a per unit increase in UCD was associated with approximately twice the rate of AD mortality (baseline model HR: 1.92, 95% CI: 1.28, 2.89; survey-weighted model HR: 2.08, 95% CI: 1.42, 3.06). In the competing risks model, this association was attenuated (HR: 1.58, 95% CI 1.06 2.36). **DISCUSSION/SIGNIFICANCE:** Our study finds chronic cadmium exposure associated with AD mortality even after accounting for competing risks of AD mortality and confounding effects of cigarette smoking and lead exposure, strengthening the evidence that long-term cadmium exposure adversely affects later-life cognitive health.

11 Clinical Manifestations of Neuroaxonal Injury

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OBJECTIVES/GOALS: The preclinical stage of Alzheimer disease (AD) is a clinically silent period that can be detected through neuroimaging and biofluid biomarkers. The goal of this study was to determine whether performance of complex daily tasks is associated with plasma biomarkers of brain amyloidosis or neuroaxonal injury in cognitively normal (CN) older adults. **METHODS/STUDY POPULATION:** This is a cross-sectional analysis of an ongoing longitudinal cohort study. CN older adults performed three complex daily tasks (shopping, checkbook balancing, medication management) from the Performance Assessment of Self-Care Skills in their home. Tasks were scored for independence, with more assistance required indicating worse performance. Participants had a plasma sample obtained within two years of completing the tasks. Plasma amyloid (Aβ42 and Aβ40) were evaluated by high precision immunoprecipitation mass spectrometry assays and neurofilament light (NfL) was measured with single molecule array (Simoa) assays. Nonparametric partial correlations were used to quantify the associations between task performance and plasma AD biomarkers, controlling for age and gender. **RESULTS/ANTICIPATED RESULTS:** 105 CN participants (mean age 74.7 years, 55% female, 88% white) were included. After controlling for age and gender, worse performance of complex daily tasks (more assistance required) was associated with increased plasma NfL (Spearman's: 0.23, p=0.04) but not plasma Aβ42/Aβ40. **DISCUSSION/SIGNIFICANCE:** This study suggests that worse performance of complex daily tasks in CN older adults may be associated with increased plasma NfL a marker of neuroaxonal injury, but not with plasma amyloid. These findings could lead to a better understanding of clinical changes that may occur prior to the onset of noticeable memory symptoms in AD or related dementias.

12 Comparison of induction agents for rapid sequence intubation in refractory status epilepticus*

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OBJECTIVES/GOALS: Multiple induction agents can facilitate rapid sequence intubation (RSI) in management of refractory status