

## THE EFFECTS OF MULTI-COMPONENT INTERVENTIONS ON COGNITION: A SYSTEMATIC REVIEW

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Given the lack of a cure for Alzheimer's disease (AD), the number of people with AD is expected to surge unless the onset is delayed. Although there have been efforts to examine the effects of single-domain neuroprotective interventions on cognition, no conclusive results have been found so far. Due to the multifactorial causes of AD, interventions combining multiple neuroprotective components may induce more beneficial effects. However, there are few comprehensive reviews evaluating the effects of multi-domain programs on cognition. Thus, the purpose of this systematic review was to evaluate the effects of currently available multi-component interventions on cognition such as global cognition, episodic memory, and/or executive function affected early in AD. The literature search was conducted using PubMed, CINAHL, Web of Science, Scopus, and PsycINFO up to September 2020. Of the 1,445 articles located, 17 met eligibility criteria ( $n = 10,056$ , mean age = 72.8 years). According to the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies, 8 and 9 studies had strong and moderate overall quality, respectively. The effect sizes of each included study were calculated using Cohen's  $d$ . Multi-component interventions comprising physical activity, cognitive exercise, cardioprotective nutrition, and/or cardiovascular health consultation/education exerted beneficial effects on cognition (very small to moderate effect sizes; Cohen's  $d = 0.16$  to  $0.77$ ). Clinically, health care providers are recommended to consider those elements to potentially stave off AD. There is a pressing need for researchers to identify optimally effective doses of neuroprotective multi-component interventions.

## TRAJECTORIES OF COGNITIVE FUNCTION AND ASSOCIATED FACTORS IN COMMUNITY-DWELLING OLDER ADULTS: A PROSPECTIVE STUDY

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There is variability in cognitive aging between individuals. This study aimed to investigate cognitive aging trajectories, the associated modifiable factors, and the association of these trajectories with dementia. Community-dwelling older adults ( $n=19,114$ ) without dementia or major cognitive impairment at inclusion were followed for up to 7 years, with regular standardized cognitive assessments. Group-based (multi-) trajectory modeling identified distinct cognitive trajectories. Structural equation modeling ( $n=16,018$ ) was used to analyze the associated predictors. Four to seven trajectories were identified per cognitive domain, with generally stable trajectories. Improvement in verbal fluency and minor psychomotor slowing were common. Substantial decline in global cognition and episodic memory were observed

in a small proportion of individuals. The highest proportions of dementia cases were in trajectories with major decline in global cognition (56.9%) and memory (33.2%). A number of sociodemographic characteristics, health behaviors and chronic conditions were either directly or indirectly associated with cognitive change in older adults. This study found that some individuals appear resilient to cognitive decline even with advancing age, and that factors that promote healthy cognitive aging are not simply the absence of factors which confer risk for decline.

## Session 9070 (Poster)

### Alzheimer's Disease II (HS Poster)

#### A PHASE I TRIAL ASSESSING LOMECEL-B INFUSION IN INDIVIDUALS WITH ALZHEIMER'S DISEASE: STUDY DESIGN AND RATIONALE

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Alzheimer's disease (AD) is an irreversible neurodegenerative disorder characterized by memory loss and persistent cognitive dysfunction which significantly compromises quality of life. Brain inflammation is a prominent feature of AD pathology. Lomecel-B which is derived from culture-expanded medicinal signaling cells (MSCs) have immuno-modulatory capacity and control inflammation and the cytokine production of lymphocytes. The primary objective of this study was to evaluate the safety of Lomecel-B infused intravenously in individuals with AD. Safety was monitored by examining vital signs, physical and neurological exams, laboratory tests (hematology, coagulation, blood chemistry, and urinalysis). This was a multicenter phase 1 double-blinded, placebo controlled trial initiated with a safety run in phase of 3 individuals followed by a randomized phase of 28 individuals. During the safety run-in phase all subjects were treated with low dose Lomecel-B no less than 5 days apart, and evaluated for safety. In the randomized phase, subjects were treated with either low or high dose Lomecel-B or Placebo in a 2:2:1 randomization ratio. The study enrolled adults aged 50-80 years diagnosed with AD via confirmatory brain MRI and PET scan and a MMSE score of 18-24. Safety and efficacy assessments were completed at 30, 90, 180, 270 and 365 days. We describe the design and rationale for this phase 1 trial with the primary objective of assessing the safety of Lomecel-B on adults with AD. The secondary efficacy measurements included ADAS-Cog 11, MMSE, TMT, UPSIT, GDS, blood biomarkers and numerous quality of life questionnaires.

#### CARDIOMETABOLIC RISK FACTORS PREDICT EXECUTIVE FUNCTION SCORES IN HIGH-RISK INDIVIDUALS

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Alzheimer's disease (AD) is expected to triple by 2050, affecting 16 million Americans. As a result, it is essential to combat this alarming increase in cognitive impairment through early detection. Cardiometabolic risk factors have shown to be associated with higher risk of AD. The purpose of this study was to determine if cardiometabolic risk factors could predict executive function scores in a high-risk population. Fifty (60.9±8.8 years) high-risk adults (classified by the Australian National University Alzheimer's Disease Risk Index) were enrolled in this study. Participants completed a 6-minute walking test, venous blood draw, blood pressure measurement, and the digit coding symbol test (DCS). Results were examined through a multiple linear regression with DCS as the dependent variable and age, sex, total cholesterol, high-density lipoprotein (HDL), low-density lipoprotein (LDL), glucose, 6-minute walking test, systolic blood pressure (SBP), and diastolic blood pressure (DBP) as predictor variables. The model explained 42% of the variance of DCS ( $p = .04$ ) with SBP (45%;  $p = .003$ ) as a significant predictor. LDL ( $p = .087$ ) and DBP ( $p = .123$ ) accounted for 24% and 22% of the variance for this model, respectively. These results suggest cardiometabolic risk factors predict executive function values in high-risk individuals. Higher SBP was significantly associated with lower DCS scores indicating SBP as a valuable tool for practitioners when evaluating cognitive decline. Further research should expand sample size and track values longitudinally to substantiate these claims.

#### CAREGIVER SINGING INTERVENTION: DO EMOTIONS AND RESISTANCE DIFFER BETWEEN VASCULAR DEMENTIA AND ALZHEIMER'S?

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Persons with dementia in residential care commonly express resistance of aggressiveness. Caregivers Singing (CS) - when caregivers sing for or together with persons with dementia during caring, has shown to reduce these expressions and increase communication and cooperation. Previous studies of CS have included both persons with Alzheimer's disease (AD) and persons with Vascular dementia (VD), but no studies have been done focusing on possible differences regarding these diagnoses. As disabilities and symptoms differ between these diagnoses, the emotions and expressions, such as resistance may differ regarding response to CS. This pilot study aims to describe emotions and resistiveness to care among persons with vascular or Alzheimer's disease. Participants were five persons with AD and five persons with VD living at two different nursing homes. Video observations (VIO) occurred with them and their caregivers during morning care situations four times without CS and four times with CS. In all, 80 VIOs were rated using the Observed Emotion Rating Scale and the Resistiveness to Care Scale. These were then analyzed with descriptive statistics. Results revealed that for both persons with AD and VD,

the positive emotion pleasure were never observed without CS while with CS it increased for both groups. In contrast to the positive emotion effect of CS, the negative emotions and resistiveness decreased more for persons with VD than for persons with AD. For persons with VD, the number of observations without anger increased, while observation without anger or anxiety/fear for persons with AD remind the same.

#### COMPARISON OF COGNITIVE INTERVENTION DELIVERY FORMATS IN PATIENTS WITH DEMENTIA-A NETWORK META-ANALYSIS

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Cognitive intervention has been shown to be effective to delay cognitive decline in older adults with dementia. However, whether cognitive intervention could be effectively delivered in individual, group, telephone, guided self-help and unguided self-help formats remains unclear. Pubmed, Embase, Cumulative Index to Nursing and Allied Health Literature (CINAHL), CINAHL, the Cochrane Central Register of Controlled Trials, Web of science, China National Knowledge Infrastructure database, Chinese Biomedical Literature database and Wan Fang database were systematically searched. 3419 records were extracted, quality assessed, and double-blind screened by 2 authors. Totally 51 studies were included which enrolled 3388 participants. Network meta-analysis (NMA) was conducted to evaluate the relative effects and rank probability of different cognitive intervention delivery formats. For older adults with dementia, guided self-help, group and individual cognitive intervention delivery formats appeared effective in improving the cognitive function, while telephone and unguided self-help were not significantly inferior to control condition. Guided self-help had the highest probability of being the best treatment among the five cognitive intervention delivery formats. Health-care professionals should apply personalized cognitive intervention format based on individual condition and preferences.

#### COMPARISON OF METHODS TO CLASSIFY ADRD IN CLAIMS AND CANCER REGISTRY DATA

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Alzheimer's disease and related dementias (ADRD) affects 10.3% of older Americans (65+), among these 15-30% go on to be diagnosed with cancer. The highest burden of ADRD is experienced by Latino/a (12.2%) and African-American (13.8%) older adults. Older patients with pre-existing ADRD are less likely to receive guideline-concordant cancer care due to lack of consideration of cognitive status, and underestimation of ADRD diagnosis is an issue in secondary data. Our study compares two validated algorithms for classifying ADRD in a sample of cancer patients, the NCI-Charlson and CMS-Chronic Conditions Warehouse (CCW) index. We used existing claims from NCI's SEER-Medicare linked database (2004-2013, N=37,932). Patients were