SESSION 10150 (LATE BREAKING POSTER)

BIOBEHAVIORAL HEALTH

PHYSICAL ACTIVITY ADHERENCE RATES IN OLDER KIDNEY TRANSPLANT RECIPIENTS: A PILOT RANDOMIZED CONTROLLED TRIAL

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Daily walking activities are associated with improving cardiovascular and well-being in older kidney transplant recipients. Multicomponent interventions using technology and goal setting holds promise for sustaining daily walking activity among this population. The purpose of this randomized controlled trial pilot study was to evaluate the feasibility of a multicomponent intervention called SystemCHANGE™ + activity tracker for daily walking activity in older (age 60 and over) kidney recipients from baseline to 12 months. The intervention group implement a personal-system solution and wore a mobile activity tracker daily for 12 months. The attention-control group received educational information on healthy living as a transplant recipient and was asked to wear a mobile activity tracker daily for 12 months. Participants were randomized 1:1 to the intervention or control group. The sample consisted of 53 participants (n = 27 intervention, and n = 26 control). At the 12-month follow-up visit, the total study attrition rate was 23%. The adherence rates at 12 months were 96.5% in the intervention group and 80.8% in the attention- control group. The intervention group increased their steps from baseline to 12 months by 334 steps per day. The attention-control group demonstrated a decrease in steps by 563 steps per day. We found a mean difference of 1041± 2440 (Cohen's d = 0.43) in daily steps between the groups from baseline to 12 months. The data suggests SystemCHANGE™ in combination with activity trackers may be feasible for older kidney transplant recipients to enhance and sustain physical activity with daily walking.

SEDENTARY BEHAVIOR, BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF), AND BRAIN STRUCTURE IN MIDLIFE: A BRAIN MRI STUDY

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Long sedentary time (ST) is associated with poor brain health but the underlying mechanisms are unclear. Studies suggest exercise increases BDNF levels, and that low BDNF levels are associated with cognitive impairment. Limited population-based studies have examined associations among sedentary behavior (SB), BDNF, and brain structures. Here we explore the mediation and interaction effect of BDNF in the association of SB to brain measures. We included 612 participants from the MRI sub-study of the Coronary Artery Risk Development in Young Adults who had plasma BDNF and SB data at the Year 25 examination. SB was estimated by self-reported average ST hours/day spent sitting while watching television, using computers, and riding transportation. Outcome measures were total and selected brain volumes in cubic centimeters (cc). ST was categorized into quartiles. We used general linear regression to examine the following associations, adjusting for age, sex, race, and intracranial volume: Interactions between BDNF and ST on MRI; ST and MRI; ST and BDNF; BDNF and MRI; and ST, BDNF, and MRI. People in the upper 25%ile ST (>8.4 hours/day) had a decreased TB volume of 12.2 cc (p=0.01) compared to the lower 25%ile (<4.3 hours/day). Neither ST nor brain measures were associated with BDNF (p>0.05). Instead, BDNF interacted with ST for TB and WM (p < 0.03): The difference of brain volumes between the upper and lower 25%ile decreased with increasing BDNF levels. Accordingly, higher BDNF levels may protect brain function in the middle-aged and potentially older populations with a sedentary lifestyle.

SEEING THE PAST THROUGH ROSE-COLORED GLASSES? AGE DIFFERENCES IN RECOUNTING A DIFFICULT MEMORY

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According to socioemotional aging theories, people better regulate their emotions in older age by reframing stressors and focusing on the positive aspects of difficult experiences. However, empirical results have been mixed. To address this gap, we examined age differences in the language use and cardiovascular reactivity of 188 adults (mean age=56, range=40-86) who relived an upsetting memory from their past. Consistent with theory, results revealed that older adults used significantly fewer negative emotion words and, among the negative emotions, marginally fewer words of anger, to describe their upsetting memory. Notably, however, there were no age differences in the expression of positive emotion or sadness. Controlling for education and cognitive function, greater expression of anger was associated with heightened systolic blood pressure (SBP) reactivity among older adults, not middle-aged individuals. Despite their expression of less negative emotion, older adults' heart rate variability (HRV) dipped lower during disclosure than did middle-aged adults'. However, among those who used more positive emotion, sadness, and/or cognitive processing words, older adults no longer showed lower HRV than middle-aged participants. Overall, these results provide some evidence of positivity bias among older adults even when asked to recount a distressing personal memory, although this trend was not consistent for the expression of sadness or positive emotion. Further, cardiovascular responses appear more clearly tied to older adults' level of engagement and emotional focus compared to their middle-aged counterparts'.

THE AGE-DEPENDENT RELATIONSHIP BETWEEN VASCULAR RISK FACTORS AND TRAJECTORIES OF DEPRESSED MOOD

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Cardiovascular risk factors (CVRFs) have been linked to depression, but it is still unclear whether this association becomes stronger or weaker from mid- to later life. Thus, our main aim was to investigate the influence of age on the associations between CRVFs and trajectories of depressed mood. Our sample included 6835 individuals (aged 52–89 years) from the English Longitudinal Study of Ageing (ELSA), who were free of manifest vascular disease at baseline and had bi-yearly measurements of depressed mood over ten years. A composite score incorporated the presence of five CVRFs: hypertension, diabetes, smoking, obesity, and hypercholesterolemia. We used second-order latent growth models to examine the effect of CVRFs, age, and their interaction on levels and changes in depressed mood over time. Our results revealed that baseline CVRFs were associated with higher levels of depressed mood. This association decreased with age and was stronger in midlife compared to later life. CVRFs were not related to changes in depressed mood, indicating that these differences remained stable over time. These findings suggest that CVRFs in midlife, but less so in older age, predict stable differences in depressed mood. They are consistent with reports on the importance of CVRFs in midlife and may support the idea that prevention of vascular burden in this age period may be critical to maintain mental health.

SESSION 10160 (LATE BREAKING POSTER)

BIOLOGY OF AGING

2-DEOXY-D-GLUCOSE-(2-DG) PREVENTS PATHOGEN DRIVEN ACUTE INFLAMMATION AND ASSOCIATED TOXICITY

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Pathogen-associated molecular patterns (PAMPs) associated with viral and bacterial infections trigger multiple inflammatory pathways which may result in oxidative stress driven toxicity, tissue fibrosis organ dysfunction and ageing. Inflammatory events need high energy demands and predominantly depends on the glycolysis. Thus, energy metabolism of the inflammatory events can be targeted to reducing the magnitude of the PAMPs driven inflammation and preventing tissue toxicity. Here we propose that 2-DG, a glycolytic inhibitor, and a potential Energy Restriction Mimetic agent (ERMA) can modulate inflammatory events and can prevent the development of acute as well as chronic pathology. For this study we induced LPS (bacterial PAMP) induced endotoxemia in mice which models infection associated inflammatory acute inflammatory events, tissue damage and organ dysfunction. 2-DG fed mice (0.4% w/v in drinking water) showed reduced LPS driven oxidative stress and capillary damage in lungs. Administration of 2-DG also reduced LPS induced spike in inflammatory cytokines (TNF, IL6 and IL1β) in the BALF and serum. Lungs of 2-DG fed mice showed lesser infiltration of inflammatory cells and reduced inflammatory signaling activation. 2-DG also downregulated the ex-vivo and in-vivo migration of the PMNCs. Furthermore, 2-DG also reduced the activation of the macrophage cells (RAW264.7) which was seen with reduction and the glycolysis and increased mitochondrial functions. Our data suggest that 2-DG administration as ERMA in drinking water can prevent pathogenic exposure driven inflammatory events which may prevent acute as well as chronic inflammatory disorders.

A DNA DAMAGE RESPONSE-INDEPENDENT MECHANISM FOR TELOMERE SHORTENING-ELICITED AGE-RELATED PATHOLOGIES

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Telomere attrition is associated with telomeropathies and age-related pathologies. In telomeropathies, telomere uncapping induces a DNA damage response (DDR) that drives apoptosis or senescence. However, a defined mechanism by which telomere attrition contributes to other age-related pathologies has not been determined. Telomere integrity is maintained by shelterin, a six-protein complex. Rap1 is the only shelterin member that is not essential for telomere capping but engages non-telomeric DNA and regulates gene transcription. We hypothesized that non-telomeric Rap1 accumulation could contribute to age-related pathologies in a DDR-independent manner. To test this, we used CRISPR/Cas9 editing to generate a Rap1 mutant mouse model in which Rap1 at telomeres is prevented, leaving only non-telomeric Rap1. Indirect immunostaining showed no differences in telomere dysfunction-induced DDR foci in Rap1 mutant compared to wild-type primary fibroblasts. Cell fractionation/western blotting of fibroblasts from Rap1 mutants demonstrated decreased Rap1 expression and Rap1 re-localization off telomeres, which mimics the same alteration of Rap1 in human cells with telomere attrition. Rap1 mutant mice exhibited increased body weight and altered metabolic and immune-response transcripts in various tissues, indicating that altered transcription could account for some of the observed phenotypes related to telomere attrition. In conclusion, telomere shortening may facilitate non-telomeric Rap1, which alters gene transcription and drives metabolic and immune dysfunction in a DDR-independent manner.

A NARRATIVE REVIEW ON THE RELATIONSHIP BETWEEN FEMALE REPRODUCTIVE FACTORS AND LONGEVITY

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