ENVIRONMENTAL ASSESSMENT OF HOUSING FOR OLDER ADULTS FACING HOUSING INSECURITY

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The Aging in the Right Place Environmental Audit (AIRP-ENV) and Secondary Observation (AIRP-ENV-SO) tools were developed to conduct observation-based audit of the built environment in shelters, transitional housing, independent housing with offsite/onsite supports, and permanent supportive housing with onsite medical and/or specialized services for older adults experiencing (or at risk of) homelessness. The 241 item AIRP-ENV tool is used to audit the presence/absence of exterior and interior built environmental features that support housing stability. The seven open-ended questions in the AIRP-ENV-SO tool is used to collect contextual data on function, safety and land-use of surrounding neighborhood. Data were collected at four sites of a transitional housing program in Vancouver, Canada as part of a multi-year, multi-city partnership project on aging and homelessness. Preliminary results demonstrate that built environment and urban design features (e.g., access, privacy, flexible and supportive spaces) contribute towards tenants' residential resiliency and aging in place.

THE ROLE OF INTERGENERATIONAL NEIGHBORHOOD RELATIONS FOR PRECARIOUS AGING DURING THE COVID-19 PANDEMIC IN GERMANY

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Throughout the Covid-19 pandemic, the immediate living environment has significantly gained importance - particularly for people framed as 'risk-groups', such as older adults. Effects of contact restrictions to contain the spread of the virus have affected inequalities, uncertainties and loneliness in later life differently depending on the intergenerational relations, informal infrastructures of provisioning and networks of solidarity given in a certain neighborhood. The paper presents findings from a recent mixed-methods study in Frankfurt, Germany, combining a quantitative survey (n=1.000) with a longitudinal qualitative study (n=60). Results show how intergenerational neighborhood relations can play a crucial role in mediating risks of pandemic precariousness in later life, but also how older adults themselves significantly contributing to neighborhood networks of provisioning. Strengthening such very local relations is key to protecting all age groups from the effects of crises beyond the pandemic, and, in conclusion, ways to do so are being discussed.

RESIDENTS' WAYFINDING CHALLENGES AND ENVIRONMENTAL INTERVENTIONS IN A CARE HOME

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This study evaluated the role of the built environment on residents' wayfinding behaviours at Louis Brier Home in Vancouver, British Columbia, Canada. The goal of this study was to explore baseline mobility challenges for the residents traveling between their bedrooms and social spaces. In response to this, low-cost environmental interventions were proposed and implemented to support safe and independent wayfinding for the residents. The project consisted of three phases. First phase involved a mixed methods approach using behavior mapping and spatial observations of the residents interacting with their physical environment, combined with one focus group with the staff members. In the second phase, researchers presented actionable environmental interventions for the care home administration to consider and implement. The final phase involved post-implementation behaviour mapping, spatial observations and a focus group session. The implemented environmental interventions influenced in improved resident wayfinding and orientation in the long-term care home.

DOING TIME: EXPERIENCES OF CARE HOME RESIDENTS IN GERMANY DURING THE EARLY PHASE OF THE COVID-19 PANDEMIC

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Residents of care homes across the globe are affected by the spread of SARS-CoV-2 as they have been identified as a high-risk group and because they experienced strict social isolation regulations during the first wave of the pandemic. Social isolation of frail older people is strongly associated with negative health outcomes. The aim of this research project was to investigate how residents in care homes experienced social isolation during the first phases of contact ban in Germany. This paper draws on structured interview data collected from 22 residents in two care homes during early June 2020 in Frankfurt/Main. The findings show that their experiences were shaped by three factors: care home staffs' approach to handling the contact ban; biographical sense of resilience; and a hierarchy of life issues. The findings highlight the importance of locally specific response mechanisms in care homes, and the need to contextualize residents' experiences.

Session 4390 (Paper)

ESPO and Biological Sciences Section Symposium: Bedside to Bench: Clinically Relevant Models of Aging

CHARACTERIZATION OF A MOUSE MODEL OF INDUCIBLE FRAILTY: THE HUMANIZED IL-6 MOUSE

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The cytokine interleukin-6 (IL-6) has pleiotropic effects in aging and is elevated in frail older adults. We have developed a conditional mouse model to better characterize the

role of IL-6 in promoting frailty and age-related mitochondrial dysregulation. The human IL-6 (hIL-6) knock-in mouse (TetO-hIL6) was developed utilizing CRISPR/Cas9 technology with transgene donor vector containing a tetracycline response element promoter driving expression of hIL-6 cDNA. Male TetO-hIL6 mice were treated with doxycycline-containing water for six weeks starting at 8 months old. RNAseq analysis of whole blood demonstrated significant upregulation of pro-inflammatory related markers at 6 weeks compared to baseline and upregulated cell proliferation and metabolism pathways. Physical testing of TetO-hIL6 mice before and after hIL-6 induction demonstrated decreased grip strength ($p = 0.003$), decreased running capacity ($p = 0.02$), and 40% increase in falls off of the treadmill ($p = 0.001$). Induced mice also demonstrated decreased basal body temperature ($p < 0.001$). Given the significant dysregulation of metabolism-related genes in RNAseq analysis and changes in basal body temperature following hIL-6 induction, we next performed untargeted metabolomics on plasma from mice at baseline and 6 weeks post-induction to better evaluate metabolic changes associated with hIL-6 elevation. We found changes in key serum metabolites, including circulating adenosine triphosphate (56% reduction, $p = 0.02$), pyruvate (35% reduction, $p = 0.0006$), alpha-ketoglutarate (47% reduction, $p = 0.04$), and succinate (306% increase, $p = 0.001$). The TetO-hIL6 mouse model allows for induction of hIL-6 at various timepoints across the lifespan and demonstrates features of a frailty phenotype.

EFFECTS OF AGE AND SOCIAL ADVERSITY ON IMMUNE CELL POPULATIONS IN A NON-HUMAN PRIMATE MODEL OF HUMAN AGING

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Significant hallmarks of aging are immune function decline and rising cumulative inflammation. These immunosenescent signatures are also found in individuals who experience chronic social adversity, independently of age. However, no studies to date have examined how social adversity alters immune function across the lifespan –data that are essential to identify the molecular routes through which social adversity might lead to increased aging-related disease. Over a two-year period, we investigated how age and social adversity (quantified by low social status) affected immunity. We measured immune cell proportions at baseline and their gene regulation after in vitro stimulation with pathogen molecules that stimulated both Th1 and Th2 immune responses in a population of free-ranging rhesus macaques. We first performed flow cytometry on peripheral whole blood to quantify changes on immune cell proportions across the lifespan (n=235) and in animals of different social statuses (n=141). We found significant decreases in CD20+ B cells and CD3+/CD4+ T cell proportions with age, suggesting diminished antibody production and adaptive immune responses in older individuals. Age-associated increases in CD3+/CD8+, CD3+/CD4+/CD25+ T regulatory cells and CD14-/CD16+/HLA-DR+ non-classical monocytes indicated heightened baseline inflammation in older animals. Social adversity recapitulated the effects of aging in CD14+/CD16-/HLA-DR+ classical monocytes, indicating immune deficits in phagocytosis and pathogen clearance in older and lower status individuals. Using RNA-seq, our stimulations (n=1,320) will allow us to identify molecular immune pathways that are disrupted by age and social adversity, similarities in response between age and adversity, and how the effect of adversity varies across the lifespan.

LOSS OF AWARENESS OR URINARY DYSFUNCTION? INVESTIGATING AMYLOIDOSIS AND URINARY PHYSIOLOGY IN A TRANSGENIC MOUSE

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Alzheimer's disease (AD) is a devastating disorder primarily affecting older adults and is the most common neurodegenerative disease in the US. More than one in three AD patients experience AD-associated urinary dysfunction (ADUD), which directly contributes to their institutionalization. While ADUD has been clinically regarded as a result of poor cognitive control over urinary function, the physiology underlying loss of urinary control remains unknown. We hypothesize that amyloidosis in the CNS results in pathologic changes in urinary structure and function. Tg-APP/PS1DE9 mice were used before plaque deposition (4-6 months) and after plaque accumulation (8-10 months) and compared to WT littermates. Behavioral assays (open field testing and voiding spot assays) were performed to assess cortical function. Pressure-flow cystometry was conducted under urethane anesthesia to assess autonomic control of urinary function without cortical influence. Pharmacomyography of bladder strips was used to determine tissue-level changes in the absence of CNS input. In Tg-APP/PS1DE9 mice, plaque accumulation resulted in significant cystometric changes to voiding phase parameters, but not storage phase parameters. Pharmacologic studies showed decreased sensitivity to adrenergic stimulation without change in muscarinic sensitivity. Behavioral assays demonstrated significant differences between transgenic animals and WT in locomotion and voiding spot sizes. We interpret our data to support AD-related pathology of Aβ accumulation results in a distinct urinary phenotype in our model, analogous to the ADUD observed in AD patients. Establishing and verifying models of ADUD may improve the efficacy of treating ADUD and increase quality of life for patients and their caregivers.

METABOLIC ADAPTATIONS TO AEROBIC EXERCISE IN AGED MICE

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