Biotechnology and Biological Sciences Research Council

Medical Research Council

ABSTRACT BOOK

Cognitive Frailty Interdisciplinary Network Development Conference

15-16 September 2022

Join the conference here:

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COGNITIVE FRAILTY

Interdisciplinary Network

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Feedback from consortia groups and next steps

You can view the online programme and join sessions here:

https://virtual.oxfordabstracts.com/#/e/cfin_2022/program

If you have any technical issues, please contact Nikolett Dravecz (Network Manager): n.dravecz2@lancaster.ac.uk

Welcome!

We'd like to welcome you to this first Cognitive Frailty Interdisciplinary Network conference.

The Cognitive Frailty Interdisciplinary Network harnesses knowledge of biological, health, environmental and psychosocial mechanisms of cognitive frailty across the lifespan so that we can develop integrated interventions. The network is one of 11 newly formed Interdisciplinary Ageing Across the Life Course networks funded by the BBSRC and MRC, with the aim of transforming ageing research in the UK and integrating expertise and knowledge across disciplines.

Cognitive frailty is a condition characterised by the simultaneous presence of physical frailty and age-related cognitive impairment without existing dementia. This conference aims to share up-to-date endeavours in this field, to build consortia for future interdisciplinary work, to provide expert input into potential interventions, and support capacity building amongst earlier career researchers.

The conference is bringing together: Biogerontologists, neuroscientists, psychologists, social scientists, health services researchers, practitioners in health and care, industry partners, policy organisations, charities, and the voices of older people.

In addition to individual papers, the programme includes a discussion on what interdisciplinary working really looks like, some training on interdisciplinary mentoring which will be followed by some mentoring pairing whereby you can volunteer to be a mentor and/or find a mentor across disciplines and sectors. There is also a study you can all get involved in to seek consensus around interventions for cognitive frailty (Delphi Study), and finally a session where we can begin to build consortia for the next stages, including applying for funding. Please look through this conference handbook to find important information about each of these aspects.

We hope you can find the time to join in all these exciting aspects of the network conference, and wish you all an excellent conference

With best wishes

The conference team: Carol Holland, Sue Broughton, Sally Fowler-Davis, Irundika Dias, Alan Gow, Lynne Corner, Niki Dravecz, Nic Wilson, Charlotte Clarke, Amanda Ellison.

Network Development Sessions

What is interdisciplinary working and are you doing it?

<u>Session time:</u> Thursday 12:25-13:10

This discussion session will be led by Professors Amanda Ellison and Judith Sixsmith.

Amanda Ellison is Executive Director of the Wolfson Research Institute for Health and Wellbeing, an interdisciplinary Institute at the University of Durham. As a physiologist with a PhD in neuroscience, she is highly experienced in understanding behaviour through the lens of the brain, the body and the environment. This has informed her approach to psychological challenges relating to brain injury, pain, addiction etc taking into account the complex interaction between biological, psychosocial, economic, environmental and other, influences. As Executive Director of the Wolfson Research Institute for Health and Wellbeing, she supports the development of transdisciplinary teams to address health challenges across multiple scales, from the experience of the individual, their families and healthcare teams in addition to translating findings to inform improvements in understanding and practice across these domains.

Professor Sixsmith, is Professor of health-related research in the School of Health Sciences at Dundee University. She has directed several UK and international projects, working with marginalised groups, undertaking participatory research alongside older adults and applying a range of qualitative and quantitative methods to understand and shape the relationship between older people and place using transdisciplinary approaches. Judith is working on two ESRC-Newton fund projects to understand and develop age-friendly communities in the UK, Brazil and India and was part of the AGEWELL network of centres of excellence in ageing and technology research and development. Judith is currently PI (with Dr Fang) on the ESRC funded project IncludeAge working on issues of community inclusion with people with Intellectual and Developmental Disability and people who self identify as LGBT+.

Interdisciplinary training for mentors and mentees: Who has time for a Mentor, anyway? The benefits of a Mentor in an Interdisciplinary world

Session time: Thursday 15:00-16:30

This session will be run by Charlotte Bonner-Evans, and focusses on the benefits of mentoring and exploring how interdisciplinary mentoring can support all our development
By the end of the session, you will have:

- Developed an understanding of mentoring principals and how mentoring supports our development.
- Identified the benefits of working with Mentors outside your disciplines.

Charlotte Bonner-Evans is an experienced and qualified people and project manager (PRINCE2 practitioner and MInstLM), having worked in the private sector, Further and Higher Education. She has managed a number of multi-million-pound research projects, developing a passion for supporting great research and great researchers. Having completed PGCerts in Counselling and Higher Education Leadership and Management, she combines knowledge and practice, as an ILM practicing coach and mentor, with her desire to support others to develop and grow through mentoring, leadership, and training. She is currently mentor for the Association of University Administrators (AUA), supporting colleagues across the UK. She works at Cardiff University, currently managing all aspects of a UK-wide Fellows' multi-faceted mentoring programme, alongside Dr Kay Guccione, as part of a network of eight UK Universities.

Delphi study Part 1: Expert viewpoints (yes that's you) on interventions for Cognitive frailty.

Session time: Friday 13:00-14:30

This session in the conference consists of the first part of a study to establish consensus from experts present at the CFIN conference and other CFIN members who could not be present, on the targets and methods of potential interventions for cognitive frailty. We are considering all members with an interest in this common syndrome to be an expert, either by your research discipline, your health or social care expertise, your industrial interests or your personal experiences. We need your help to understand how best to design and offer interventions that would work and also be acceptable to older people. If you would like to take part, please read the Participant Information Sheet, email Carol Holland with any questions (c.a.holland@lancaster.ac.uk) and then fill in the consent form if you would like to take part. The Participant Information Sheet and Consent form are attached to the email in which you received this handbook.

Consortia Development:

<u>Session time:</u> Friday 16:45-18:00

This section will consist of a series of break out rooms where you can discuss a series of questions put together from our existing investigators and External Advisory Group members, and then debate your chosen question in more depth. The idea is that you begin to come up with ideas for research proposals and for applying together for the small pump priming funds we have available. The questions are below. Please choose one and let Niki Dravecz know (n.dravecz2@lancaster.ac.uk) so she can put you in a break-out room. You will be allocated randomly if you don't want to choose.

Consortia interdisciplinary question ideas:

- What kinds of trans-disciplinary research can address the environmental burden that may be related to cognitive frailty, on individuals and communities of older people?

- Co-production of tech and digital specification across disciplines is vital- how can the network support new ways of working and collaborating with a view to designing potential interventions in the area of cognitive frailty?

- To what extent are inequalities (social and economic determinants) reflected in the bio, psycho, social domains of older adults and how can we develop this knowledge and use it in work on cognitive frailty?

- Population health approaches suggest that climate shocks in relation to environment will most negatively affect poor and old (as it was with Covid). What can we do about the potential impacts on ageing mechanisms?

- How can we, as researchers, step into each other's shoes and gain insight into what science looks like when it is very different to our own? What would your next research project look like?

- What needs to be done next to distinguish multi-source predictors of cognitive frailty from predictors of other age-related syndromes?

Individual Paper Abstracts

Scoping Review: To what extent do wider environmental factors (air quality and green spaces) predispose individuals and groups to cognitive frailty or resilience

Sally Fowler Davis, Charlotte Benkowitz

Sheffield Hallam University, Sheffield, United Kingdom

Time: **Evidence Synthesis 1 – Thursday 13:10-13:30**

Abstract

The results of a scoping review undertaken according to Arksey & O'Malley 2002 will be presented to provide insight into environmental factors associated with risks to cognition. The term frailty often used in relation to physical limitations and research tends to reflect prevalence of cognitive frailty in individuals and not the environmental risks to health. Similarly, the management of cognitive problems is often associated with behaviour change/therapeutic interventions i.e. medication use or changes to nutrition and physical activity rather than wider community initiatives.

This review investigated how green space and air quality affects cognition in older adults. International literature related to cognitive risks and changes was analysed with reference to potential inequalities across communities. The searches concentrated on air quality, green space and social engagement using cognition and using resilience and ageing interchangeably. This paper will present interim findings on air quality and green space.

The project is based on a population health approach that recognises how the interrelated conditions and systematic variations in the experience of specific and sometime vulnerable populations can make a difference to cognitive frailty. The results will be used to develop further research and inform policy around well-being and particular reference will be made to disparity of community conditions as a wider determinant of health and wellbeing.

Discipline

["Health Research"]

1.1 - How do psychological and social factors influence the experience of ageing with coexistent frailty and cognitive impairment: a life course analysis

Alison Ellwood[1,2], Catherine Quinn[1,2], Elizabeth Teale[3], Gail Mountain[1,2]

[1]University of Bradford, Bradford, United Kingdom. [2]Wolfson Centre for Applied Health Research, Bradford, United Kingdom. [3]University of Leeds, Leeds, United Kingdom

Time: Paper Session 1 – Thursday 13:30-14:45

Abstract

Frailty and cognitive decline often co-exist as people age. Those living with this coexistent state are at increased risk of adverse outcomes. Furthermore, services often neglect to attend to this relationship. It is important to understand psychological and social factors which may contribute to, or protect against, coexistent decline. Little consideration has been given to the importance older people themselves place upon their social and psychological circumstances as they age. This study aimed to use narrative inquiry methods to contribute to our understanding of independence and dependency in frailty, and the life-course factors which may impact upon physical and cognitive decline. Nine men and eight women, living with frailty and mild cognitive impairment, were recruited from the Community Ageing REsearch 75+ study. A cohort of people aged 75 and over, across the United Kingdom. The life histories of participants were obtained through telephone interviews, due to the restrictions of the Covid-19 pandemic. Data were analysed thematically. Participants spoke variably about the impact of childhood deprivation; the importance of education appeared less significant than career and financial wellbeing. Narratives were often gendered. Physical decline was anticipated, and accepted to varying degrees, cognitive change was more feared. Future dependency was a source of apprehension. Most participants engaged with behaviours they believed would promote healthy ageing. For many participants relationships with spouses and family members dominated stories. The nature and quality of relationships in later life significantly contributed to participants wellbeing. Services which are more proactive about frailty status are required.

Discipline

["Epidemiology","Health Research","Gerontology","Health Services Research","Health/Social care professional"]

1.2 - Frailty and resilience in older age: the role of cognition and cognitive reserve

Carol Holland

Lancaster University, Lancaster, United Kingdom

Time: Paper Session 1 – Thursday 13:30-14:45

Abstract

Longitudinally, frailty increases risk of future cognitive decline, and cognitive impairment increases risk of future frailty, suggesting common pathways or interaction within underlying mechanisms associated with ageing. This conjunction of physical frailty and Cognitive Impairment No Dementia (CIND) has been described as Cognitive Frailty (CF). Occurrence of frailty in cognitively impaired older people rapidly worsens their physical and mental health, increasing impact on their economic activity, independence, need for care and so economic cost to society. Frailty is often conceptualised as an absence of resilience, e.g., as an imbalance between stressors and resilience reserves, with resilience conceptualised in physical terms such as homeostasis and immune system function, and CF has also been described as a state of reduced cognitive reserve that it is different from physiological brain ageing. However, work has indicated the positive impacts of psychological resilience and cognitive reserve on frailty and its negative outcomes. This presentation will summarise a series of studies in which the concept of "resilience despite frailty" is apparent, with people of similar levels of physical frailty showing very different coping and resilience and outcomes such as need for care. Using both quantitative and qualitative data, the studies demonstrate the role of moderators such as psychological resilience and cognitive reserve on the relationship between frailty and cognitive impairment, , with implications for intervention.

Discipline

["Psychology","Health Research","Gerontology"]

1.3 - Cognitive effects of chronic low-level carbon monoxide exposure in older adults

Beth Cheshire, Carol Holland, Trevor Crawford

Lancaster University, Lancaster, United Kingdom

Time: Paper Session 1 – Thursday 13:30-14:45

Abstract

Evidence of the cognitive effects associated with low-level carbon monoxide (CO) is limited, but indicates neuropsychological impairments may follow exposure. Older adults may be specifically vulnerable due to reduced physiological reserve and pre-existing disease increasing susceptibility. Home exposure to low-level CO may be an unidentified cause of cognitive impairment that improved awareness could prevent. We examined impacts of low-level CO in 106 older adults (aged ≥60 years) investigating hypotheses that chronic exposure would be associated with impaired cognitive function. Continuous ambient CO levels were monitored over 1-month and participants completed a cognitive battery. Performance significantly increased with greater CO exposure (M=.09ppm; range=0-29ppm) across a range of cognitive functions including working memory, memory recognition, visuospatial ability, problem solving and selective attention. Repeated CO monitoring and neuropsychological assessments were carried out at 7-months with 78 participants. Cognitive performance significantly increased across a range of functions with greater CO exposure (M=.07ppm; range=0-26ppm) following the second monitoring period. However, the longer-term impact from the initial exposure at 7-months and the total exposure over both monitoring periods were associated with negative performance effects. Performance decreased with greater CO exposure in areas of selective attention, visuospatial ability, problem solving, memory recognition, auditory working memory and cognitive flexibility. Chronic exposure to extremely low-level CO appears to have beneficial effects on a range of cognitive functions in the short-term following exposure. However, the majority of these effects were short lasting and resulted in longer-term negative impacts given sufficient time post-exposure or accumulation of two one-month exposure periods.

Discipline

["Psychology","Health Research","Population Health"]

1.4 - Planning Dimension of Frailty and Cognitive Function: Longitudinal Trajectories

Stacey Voll[1], Graciela Muniz Terrera[2,3]

[1]University of Victoria, Victoria, Canada. [2]Ohio University, Athens, USA. [3]University of Cambridge, Cambridge, United Kingdom

Time: Paper Session 1 – Thursday 13:30-14:45

Abstract

Difficulties in daily functioning in IADL and ADL tasks that involve planning and preparation emerged as a distinct dimension in the development of a five-factor frailty measure. Utilizing waves 2 - 8 of the English Longitudinal Study on Ageing (ELSA), a longitudinal, psychometric robust measure of frailty was developed, independently, for males and females. Longitudinal examination of age showed that scores of dysfunction on the planning dimension for frailty first appear, for males, around the age of 73, with a 2.0 linear increase of dysfunction per year, from 79 years on. For females, planning tasks became difficult around the age of 76, becoming increasingly dysfunctional (with linear increase of 2.5 per year) from age of 82 years onwards. Linear Mixed Models (LMM) were used to determine the association of cognitive function change and the trajectories of planning-dimension scores of this five-factor frailty measure, over time and age.

The purpose of this presentation is to provide an understanding of the associations with cognitive function of individuals identified within the planning-dimension of frailty. LMM results of the planning dimension frailty scores and cognitive function as measured in ELSA will be presented.

Learning objectives for the participant will be to gain insight into the need and use of psychometrically identified components of frailty and how cognitive function and dimensions of frailty change for people over time while they age.

Discipline

["Epidemiology","Psychology","Health Research","Gerontology","Population Health"]

A multidisciplinary scoping review of research focusing on understanding biological and psychosocial mechanisms and exogenous factors as related to cognitive frailty

Carol Holland[1], Nikolett Dravecz[1], Lauren Owens[1], Susan Broughton[1], Alex Benedetto[1], Alan Gow[2]

[1]Lancaster University, Lancaster, United Kingdom. [2]Heriot Watt University, Edinburgh, United Kingdom

Time: **Evidence Synthesis 2 – Thursday 16:30-16:50**

Abstract

Scoping reviews are particularly useful to categorise elements of a field, identify research gaps, make recommendations for future research and determine groupings of sub-topics that may be revealing as to mechanisms. This scoping review will focus on mechanisms underlying cognitive frailty. Inclusion criteria were studies published after the 2013 IANA/IAGG definition paper, that use a definition of cognitive frailty or focus on the conjunction of cognitive impairment no dementia and frailty. Studies were excluded if they were based in specific disease populations (e.g. dementia, cancer, HIV), had no definition of frailty or focused only on epidemiology or prediction of mortality. Both animal and human studies (age >65) were included. Lifespan research was included where the focus was on relevant ageing outcomes.

Searches were conducted using Web of Science, PubMed and Science direct, and related reviews were searched for further papers. Search terms included “cognitive frailty” OR (“cognitive decline” OR “cognitive impairment”) AND (frail*)), with terms to elicit mechanisms, predictors, causes, pathways and risk factors. To ensure inclusion of animal models, we used keywords such as behavioural or cognitive decline or senescence, and specific models (drosophila, C.elegans, mouse). Initial stages gave 4730 papers after deletion of duplicates, and screening will be done in two stages: by title and abstract, followed by full text. Data collection will include potential mechanisms evaluated in studies. A descriptive analysis will be used to provide a high-level summary of the number of studies evaluating different mechanisms and suggestions of clear gaps in the literature.

Discipline

["Biology","Psychology","Neuroscience","Health Research","Gerontology"]

2.1 - What Keeps You Sharp? Exploring the public understanding of cognitive health in a UK-wide survey

Alan Gow[1], Malwina Niechcial[1], Eleftheria Vaportzis[2]

[1]Heriot-Watt University, Edinburgh, United Kingdom. [2]University of Bradford, Bradford, United Kingdom

Time: Paper Session 2 – Thursday 16:50-17:50

Abstract

As we age, we might expect to experience changes in our thinking skills, including our memory and reasoning. Although there are broad trends in the changes observed, there is variation from person to person in the timing and extent of those changes. That is, some people may maintain their cognitive health into older age, while others experience changes that reduce their quality of life or affect their ability to live independently. This variation has directed attention towards identifying the potential determinants of cognitive health in terms of risk or protective factors. As research continues to develop our understanding of potential determinants, it is also important to consider the public understanding of cognitive health. What Keeps You Sharp? was a UK-wide survey of over 3,000 adults aged 40-98 years old. Respondents were asked a range of questions about cognitive health, including the ages changes might be expected across different cognitive domains, the control we might have over those changes, and the factors that might protect or harm our cognitive health as we age. An overview of those findings will be provided, including how often people reported participating in potentially beneficial behaviours to specifically support their cognitive health. The UK-wide results will be compared to other cognitive and brain health surveys from around the world, before considering how a better understanding of what people know about cognitive health might be used, for example, in ensuring that any resultant messages target the most appropriate issues.

Discipline

["Psychology"]

2.2 - Is it time to look beyond the brain to treat neurological conditions? Gut-brain axis and microbiome: potential new therapeutic adjuncts to current approaches

Lynne Barker[1], Caroline Jordan[2], David Sanders[3], Richard Grunewald[4], Bernard Corfe[5], Caroline Dalton[6], Holly Wilcockson[7]

[1]Centre for Behavioural Science, Sheffield Hallam University, Sheffield, United Kingdom. [2]University of Derby, Derby, United Kingdom. [3]Professor of Gastroenterology, Royal Hallamshire Hospital, Sheffield Teaching Hospitals NHS Foundation Trust & the University of Sheffield, Glossop Road, S10 2JF., Sheffield, United Kingdom. [4]Clinical Director of Neurosciences, Sheffield Teaching Hospitals, NHS Foundation Trust, Royal Hallamshire Hospital Sheffield, S10 2JF, Sheffield, United Kingdom. [5]University of Newcastle, Newcastle, United Kingdom. [6]Department of Biosciences and Chemistry, Faculty of Health and Wellbeing, Sheffield Hallam University, Sheffield, United Kingdom. [7]Centre for Behavioural Science and Applied Psychology, Sheffield Hallam University, Sheffield, United Kingdom

Time: Paper Session 2 – Thursday 16:50-17:50

Abstract

Parkinson's Disease (PD) is a neurodegenerative condition that affects multiple motor and non-motor functions (Berg et al., 2014). There is no cure, and the definitive cause is not yet known. One pattern of underlying pathology involves the accumulation of abnormal clumps of alpha-synuclein protein (Lewy bodies) in the central nervous system (CNS) of people with Parkinson's (PwP) that impede normal neuronal function. Evidence indicates that the production of alpha-synuclein begins in the gut (Lebouvier et al., 2010). Gastrointestinal problems termed gut dysbiosis are a common feature in PwP (Ghyselinck et al, 2021; Pfeiffer, 2003). Importantly, gut dysfunction is a cardinal symptom in PwP and may precede other symptoms by two decades. Emerging evidence is suggesting a role of microbial species to maintenance and potential pathogenesis of the condition.

We conducted a 12-week feasibility study with PD patients randomly allocated to either: (i), probiotic arm (Symprove) or (ii), placebo arm. Behavioral (mood, sleep, cognition, symptoms, quality of life measures) and microbiome data (extracted and sequenced using 16s), were collected at baseline and 12 weeks for both groups. Here we present preliminary species data on the PD signature of our sample and microbial shifts based on probiotic versus placebo arm. Findings present potential new avenues for large scale neurological and microbiome-based studies to inform knowledge of pathophysiology of motor disorders, gut dysbiosis and neurological conditions (Boddy et al., 2021). Potential therapeutic adjuncts are proposed.

Discipline

["Biology","Psychology","Neuroscience","Health Research","Health/Social care professional"]

2.3 - Balancing the odds: Investigating the molecular connections between risk factors and dementia

Fiona Kerr

Edinburgh Napier University, Edinburgh, United Kingdom

Time: Paper Session 2 – Thursday 16:50-17:50

Abstract

Dementia is a growing concern for our ageing population, affecting 50 million people globally, with rapidly increasing prevalence across the world. A priority area for scientific research is therefore to improve patient lives and find disease-modifying treatments for dementia which do not currently exist. While ageing and genetics pose significant risk, recent large scale epidemiological analyses have uncovered 12 modifiable risk factors for dementia, including lifestyle, environmental and social factors, which may account for up to 40% of dementia cases. Whether there are direct causal connections between these factors and disease pathogenesis requires further exploration.

Our group investigates the potential molecular links between various risk factors for dementia, including ageing and air pollution, and neurodegeneration, using the fruit fly, Drosophila Melanogaster, and human neuron models of Alzheimer's disease (AD). We have shown that the ageing fly brain is intrinsically more vulnerable to toxicity from the AD-associated Aβ42 peptide, and that promoting activity of the longevity gene Nrf2 reduces Aβ42-induced neurotoxicity in flies and both mouse and human neurons. More recently our preliminary studies have investigated the effects of the surrogate air pollution-derived nanoparticle, ultrafine carbon black (UFCB), on neuroinflammation, establishing a suitable sub-lethal and lethal dose-range in human astrocytes for studying these interactions, as well as their subsequent effects on neuronal viability.

Establishing cause and effect relationships between particular risk factors and development of dementia would provide valuable supporting evidence to drive changes in policy that could prevent disease, and potentially identify new targets for early therapeutic intervention.

Discipline

["Biology","Neuroscience"]

3.1 - Cognitive frailty as a risk factor for falls among the rural community-dwelling older adults: A cross-sectional study in West Bengal, India

Sayani Das

University of Calcutta, Kolkata, India

Time: Paper Session 3 – Friday 14:30-15:45

Abstract

Background: Falls are one of the major causes of death and disability among older adults. Worldwide, epidemiological studies have identified cognitive frailty as a risk factor for falls in ageing, but there is a paucity of data in India. To address this gap, this study examined the association between cognitive frailty and falls in rural community-dwelling older adults in India.

Methods: From October 2018 to January 2020, during face-to-face interviews, community-dwelling older adults aged 60 years and above in West Bengal, India, were evaluated for a history of falls without fracture, nutritional status, depression and rheumatoid arthritis status, and socio-demographic characteristics were collected. Physical frailty was assessed using a modified, five-item version of the Fried frailty phenotype (physically frail (PF) ≥ 3) scale. Cognitive function was assessed using the Mini-Mental State Examination (cognitive impairment (CI) ≤ 25) scale. Study participants were grouped as cognitively frail (PF and CI), PF, CI, and robust (non-CI and non-PF).

Results: Overall, in 510 (230 male and 280 female) participants, the prevalence of falls and cognitive frail was 24.5% (95% CI 20.8%–28.5%) and 21.8% (95% CI 18.2%–25.6%), respectively. Multinomial logistic regression analysis revealed that only the cognitively frail group, compared to the robust group, had a significant association with falls adjusting for the covariates (OR 2.4, 95% CI: 1.2–4.9, P = .014).

Conclusion: Present study results are significant and provide empirical evidence about the usefulness of understanding the cognitive frailty to prevent falls and promote active ageing in rural India.

Discipline

["Population Health"]

3.2 - Association between preclinical gait speed deterioration and EEG abnormalities in older adults.

Daysi Garcia-Agustin[1], Valia Rodriguez-Rodriguez[2]

[1]Cuban Centre for Longevity, Ageing and Health Studies, Havana, Cuba. [2]Aston University, Birmingham, United Kingdom

Time: Paper Session 3 – Friday 14:30-15:45

Abstract

Physical and cognitive declines at an older age are preceded by preclinical changes that accumulate over time until they become clinically evident difficulties. These changes must better respond to strategies aimed at preventing disabilities and dependence in later life than fully established conditions. The objective of this study was twofold; to provide further support for the need to screen for preclinical changes in older adults' functionality and to assess for the presence of an early association between decline in mobility and cognition.

A cross-sectional cohort study was carried out in a group of 95 active older adults. We measured their gait speed at the usual pace (0.8 m/s cut-off point) and their cognitive status using the MMSE. A quantitative analysis of their resting-state EEG was also performed to assess for modifications in the brain function in relation to a preclinical decline identified in any of the two measures.

70% of the sample had a preclinical gait speed deterioration, of which 80% also had an EEG frequency composition abnormal for the age. While there was no statistically significant difference in the MMSE between participants with a gait speed above and below the selected cut-off, individuals with MMSE scores below 25 also had a gait speed<=0.8 m/s and abnormal EEG frequency composition.

Our results provide further evidence of the presence of preclinical declines in older adults and point to the need for clinical pathways that incorporate screening and early intervention of hidden deterioration to prolong the years of functional life.

Discipline

["Health Research","Gerontology"]

3.3 - Investigating Insulin/IGF-like Signalling and Brain Ageing in Drosophila melanogaster

Nikolett Dravecz, Susan Broughton

Lancaster University, Lancaster, United Kingdom

Time: Paper Session 3 – Friday 14:30-15:45

Abstract

The goal of research into the biology of ageing is to understand the ageing process itself so that we can find therapeutic interventions that can prevent, slow or delay the onset of ageing-related diseases and declines in function. Research in model organisms (worms, flies and mice) has identified the highly conserved IGF1/Insulin signalling (IIS) pathway as a key lifespan modulator and evidence is accumulating that lifespan extending IIS reductions can also improve health with age. However, IIS is required for diverse roles in the CNS including neuronal survival and function so it is not surprising that recent studies have found a disconnection between lifespan extension and behavioural health-span. We therefore need to look more closely into neuromuscular health and cognition in ageing model organisms to elucidate the relationships between lifespan, general healthspan and healthy brain ageing, and how IIS alterations that are otherwise beneficial can impede behavioural function.

Here we talk about our work in the model organism Drosophila melanogaster showing that lifespan extension due to reduced IIS can occur concurrently with normal, ameliorated or exacerbated locomotor senescence and pan-neural IIS reductions are not beneficial to the neural circuitry underlying locomotor behaviours. We also discuss our most recent findings that reduced IIS in serotonergic neurons mediates the beneficial effects of reduced IIS on lifespan and in cholinergic neurons mediates the detrimental effects on locomotor behaviour. Our work thus aims to identify the mechanisms that modulate brain ageing and cognition in response to IIS in order to find therapeutic interventions that optimise neuromuscular/behavioural system ageing and so extend healthspan in humans.

Discipline

["Biology","Neuroscience"]

3.4 - Lipid soluble micronutrients and cognitive impairment

Irundika Dias[1], Helen Griffiths[2]

[1]Aston University, Birmingham, United Kingdom. [2]Swansea University, Swansea, United Kingdom

Time: Paper Session 3 – Friday 14:30-15:45

Abstract

Emerging evidence in nutritional cognitive neuroscience indicates that specific nutrients may preserve cognitive function and slow the progression of cognitive impairment, including within dementia. The major risk factor for cognitive decline is age. The results from vascular- and nutrient-related preventive strategies are promising, but the interactions between lipid soluble micronutrients and cognitive impairment have not been clearly identified. Our previous work shows blood antioxidant levels are lower in patients with cognitive impairment. In parallel, lipids are more rancid (oxidised), and levels are elevated in these patients. This data indicated that the higher the concentration of these lipids, the lower the cognitive function. We hypothesised that during neurodegeneration, lower concentrations of micronutrients in a person's general system are reflected by lower brain micronutrient status, greater lipid oxidation and that this contributes to neurodegeneration via oxidative and metabolic stress. Our results show that physiological concentrations of modified lipids induced neuronal oxidative stress, but this can be mitigated by the micronutrients in a dose dependent manner. At laboratory conditions, delivery of micronutrients protected cells under mild stress but not cells at higher stress. This data suggest micronutrients may be useful at early stage of cognitive impairment. However, future human intervention studies will be needed to prove this observation.

Discipline

["Biology","Health Research"]

4.1 - Does palliative care intervention during hospital admission improve outcomes for adults with frailty? A systematic literature review and narrative synthesis.

Phoebe Sharratt[1], Amarachukwu Nwosu[1], Antony Zacharias[2], Amy Gadoud[1]

[1]Lancaster University, Lancaster, United Kingdom. [2]Whittington Hospital, London, United Kingdom

Time: Paper Session 4 – Friday 16:00-16:45

Abstract

Background: It has been demonstrated that patients with frailty have palliative care needs towards the end of life, but older patients have less access to palliative care services. Roughly 4000 patients per day are admitted to UK hospitals with some degree of frailty and this number is predicted to increase. Understanding how non-specialist teams can best deliver palliative care to frail patients in hospital is of utmost importance to promote individualised care plans and access to palliative care services for this underserved population.

Objectives: This systematic review will synthesise evidence regarding palliative care for patients with frailty in the hospital setting to:

- Identify the clinical assessment methods used to identify palliative care needs for hospital patients with frailty.
- Describe the types of palliative care approaches trialled for hospital patients with frailty.
- Analyse whether these approaches improve quality of life, symptom burden and healthcare utilisation for these patients.

Methods: A systematic literature review will be completed as outlined by PRISMA guidance. Electronic searches of PsycINFO, MEDLINE, CINAHL, EMBASE, EThOS, NHS Evidence, SCIE, Scopus, Web of Science and Cochrane Library from database start dates to April 2022 have been completed. Included studies will investigate palliative care interventions in the acute hospital setting for patients with frailty. A narrative synthesis will be completed for included studies.

Results: Initial searches have revealed 39,386 titles prior to de-duplication.

Conclusion: Review of initial searches estimates around 10 titles will be eligible for inclusion. These will be synthesised by identification of needs, intervention types and patient outcomes.

Discipline

["Gerontology","Other"]

4.2 - Can Musical Training Protect Against Cognitive Decline in Older Age?

Ryan Gray[1], Michaela Dewar[1], Michael Craig[2,1], Alan Gow[1]

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Time: Paper Session 4 – Friday 16:00-16:45

Abstract

There is growing interest in the effect that musical experience has on cognition in older age. Studies have suggested there is a positive relationship in which musical experience may delay or reduce age-related decline in some cognitive domains. For example, older adult musicians commonly outperform non-musicians in cognitive tasks related to working memory and processing speed. However, the findings are inconsistent, and this heterogeneity may stem from methodological limitations. Cross-sectional studies rely heavily on span tasks as measures of working memory, which fail to account for temporal components. Studies also commonly employ 'years of experience' as a grouping criterion for musicians and non-musicians, rather than considering factors that comprise musical experience. There is also a lack of understanding regarding the neurocognitive underpinnings of benefits associated with musical training, particularly in older adults.

This presentation will outline the current understanding of musical experience in protecting against age-related cognitive declines. It will also briefly cover how the current PhD project will build on this work and address known limitations through a variety of methods. The first stage of our project plan will consist of secondary data analysis. Should access to relevant datasets be granted prior to the conference, some preliminary results may be shared.

In understanding the nuances of any relationship between musical training and cognition, interventions targeted towards engaging with music throughout the lifespan can be developed to promote brain health and reduce age-related declines in thinking skills.

Discipline

["Psychology","Neuroscience","Gerontology"]