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Objective: Psychosocial stress has been associated with impaired cognition and risk for neurodegenerative disease. However, the intermediate pathways underlying this relationship are not yet well understood. Chronic exposure to stress causes endocrine and immune dysregulation that can lead to heightened systemic inflammation. Moreover, chronic, low-grade inflammation has been linked to neurodegeneration, impaired neurogenesis and cognitive decline. Given the strength of the individual links between stress, inflammation and cognition, the current study tested the hypothesis that inflammatory biomarkers would mediate the relationship between perceived stress and executive functions.

Participants and Methods: Data from the Midlife in the United States Study (MIDUS) (N=863; Mean age= 52.72) provided measures of perceived psychological stress, inflammatory biomarkers [C-reactive protein (CRP) and interleukin-6 (IL-6)] and executive functions. Structural equation modeling (SEM) was used to test for the mediating effect of inflammation on the relationship between perceived stress and executive functions. Exploratory analyses were conducted to investigate whether sex-differences were driving these relationships. Mediation analyses adjusted for age and history of smoking.

Results: In the full sample of men and women, there was a significant indirect effect of perceived stress on executive functions through inflammation [$B=-0.021$, $z=-2.841$, $p=0.005$]. Further examination revealed that this effect was present in women [$B=-0.039$, $z=-2.680$, $p=0.007$] but not men [$B=-0.003$, $z=-0.558$, $p=0.577$]. While inflammation was negatively associated with executive functions in both men and women [$B=-0.126$, $z=-1.930$, $p=0.050$; $B=-0.279$, $z=-0.558$, $p>0.001$], pathways linking perceived stress to inflammation and executive functions were only significant in women [$B=0.014$, $z=-3.190$, $p=0.001$; $B=-0.192$, $z=-3.355$, $p=0.001$].

Conclusions: These findings suggest that inflammatory biomarkers are a viable pathway for explaining how experiencing stress can negatively affect executive functions. Results indicate that women may be particularly vulnerable to the inflammatory and cognitive consequences of stress. As such, psychosocial stress and associated inflammation may be important targets for improving cognitive health outcomes, particularly in women.

Categories: Other

Keyword 1: chronic stress

Keyword 2: executive functions

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Poster Symposium: How Well do Western Methods Used to Assess Atypical Aging in Western Countries Generalize to Sub-Saharan African Countries?

Chair

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Discussant

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Summary Abstract:

Risk factors associated with development of neurodegenerative disease has been well-studied in Western and European populations. However, there has been considerably less research in the assessment of such risk factors in developing countries, notably sub-Saharan Africa. There is a paucity of data at the micro level (e.g. neuroimaging and biomarker data) and macro level (e.g. cognitive assessment and psychosocial/environmental risk factors) for development of neurodegenerative conditions in these populations.

This symposium examines Western methods of assessment of risk factors and cognitive profiles of older adults at risk for neurodegenerative disorder to determine if they are relevant to sub-Saharan African populations, specifically older Congolese adults. This symposium utilizes an older adult sample that has been comprehensively assessed both at the cellular level (via blood biomarkers and neuroimaging typically used for assessment of dementia in Western populations), to the individual functional level (via cognitive assessment), to finally, psychosocial and environmental risk factors for dementia seen at a community level. First, Dr.

Ikanga will present on the association between performance on the African Neuropsychological Battery (ANB) with biomarkers specific to Alzheimer's disease and more general vascular risk factors for cognitive decline. Second, Dr. Hickie will present on structural neuroimaging data of mesial temporal lobe atrophy in comparison with performance on the ANB. Dr. Reyes will then discuss the utility of a cognitive screener developed for use in Sub-Saharan Africa on older adults from the Democratic Republic of Congo, with specific emphasis on educational corrections. Finally, Dr. De Wit will discuss health and psychosocial predictors of depressive symptoms as well as the relation between depressive symptoms and neuropsychological functioning in Congolese older adults, to determine if neurocognitive profiles are similar in Sub-Saharan Africa relative to Western populations.

This "micro to macro" approach is unique in providing a comprehensive overview of risks associated with dementia in Congolese adults. This is the first study of its kind to utilize a multi-method approach for older adults at risk for dementia in Sub-Saharan Africa, and results suggest that some approaches are more valid in this population than others. Future areas of research will be discussed, as well as feasibility and validity of Western approaches in assessment of dementia to non-Western populations.

Keyword 1: cross-cultural issues

Keyword 2: dementia - Alzheimer's disease

Keyword 3: assessment

94 Associations Between African Neuropsychological Tests of Memory and Medial Temporal Lobe Structures in Older Congolese Adults with Suspected Dementia

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Objective: Hippocampal and medial temporal lobe structure atrophy is commonly observed in patients with mild neurocognitive disorders and dementias of various neurodegenerative conditions, with the degree of atrophy in these regions correlating with cognitive performance on memory tasks. This research has been conducted largely in western and educated countries. As cognitive aging, risk factors, clinical course, and neuropathology can differ between individuals of different races and ethnicities, our goal is to determine whether these findings also generalize to patients with suspected dementias living in the Democratic Republic of the Congo (DRC).

Participants and Methods: Neuroimaging and cognitive data have been collected on 40 subjects with probable dementia from the DRC and 40 age-, education-, and gender-matched controls. Patients were classified into groups based on scores on the Community Screening Instrument and the Alzheimer's Questionnaire. All participants completed the African Neuropsychological Battery. T1 MPRAGE images were acquired on Siemens 1.5T scanner. Freesurfer was used to derive volumes and cortical thickness of medial temporal lobe regions. Volumes of structures were divided by intracranial vault volumes to adjust for head size. T-tests were used to compare hippocampal volumes, entorhinal cortex thickness, and perirhinal cortex thickness between subjects with probable dementia compared to healthy age-, gender-, and education-matched controls.