Physiological correlates of global cognitive decline: Hearing, body mass and strength

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Purpose

- by 2050, Alzheimer's Disease is projected to affect 1 million new cases each year
- identifying markers in the prodromal phases is critical for early detection and intervention
- physiological markers of fitness may be correlated with cognitive function
- relationship between global cognitive function and physiological factors need further investigation

Methods

- Older male and female adults who met enrollment criteria
- Primary endpoint: Global Cognitive Score was assessed using the Montreal Cognitive Assessment (MoCA)
- Exploratory measures of Global Cognition included:
  - verbal memory (ADAS)
  - executive function (Stroop AC ratio)
- Single bout of interactive physical and cognitive exercise (iPACES)
- BMI measured as weight/height
- Strength assessed using Modified Sit-and-Stand (SNS)
- Hearing assessed using standard auditory test
  - volume at 1000, 2000, 4000 Hz were averaged to yield the Pure Tone Average (PTA)
- Linear regression analysis to determine relationship between three physiological variables (hearing, strength, BMI) and MoCA
- Exploratory analysis of relationship between verbal memory (ADAS) and executive function (Stroop AC ratio)

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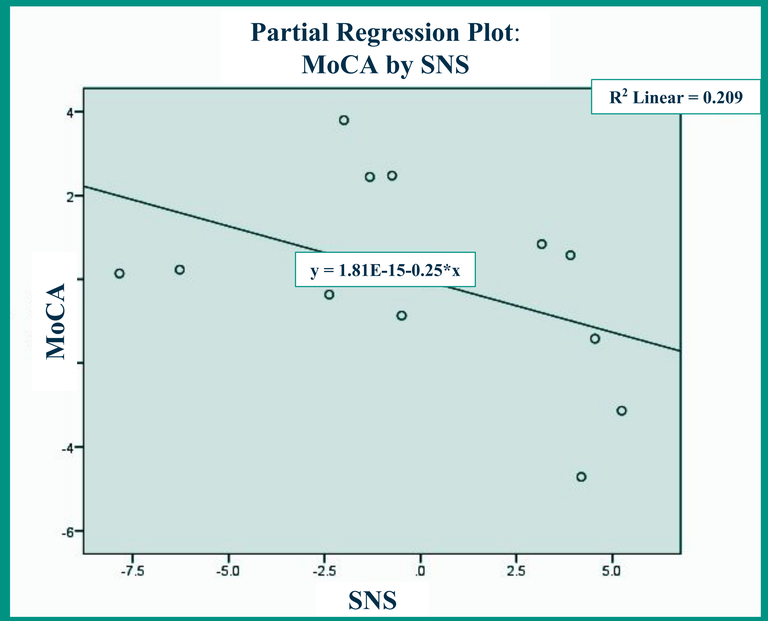

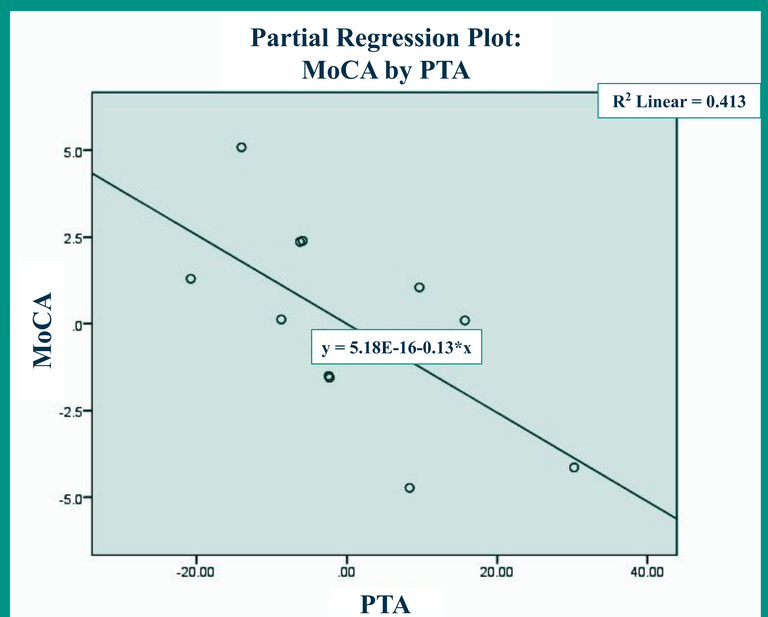

Results

- 14 subjects, out of total of 38, qualified for the each of the factors studied; 8 with MoCA <26
- Mean age = 76.57 years; mix of men & women
- Mean BMI = 25.2
- Significant association between PTA and MoCA scores (p =.045)
- modified Sit-and-Stand (SNS) and BMI not significantly associated
- No significant association between BMI, SNS, and PTA and ADAS and Stroop AC ratio

Conclusions

- Hearing was most strongly associated with global cognition which is consistent with prior research
- Strength and BMI not significantly related
- Exploratory analysis of verbal memory and executive function did not find a significant relationship with physiological measures
- A larger sample size may be needed to detect a relatively weaker relationship between variables
- Hearing test results demonstrated strong relationship with global cognition suggesting a simple physiological measurement

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