

neuroprotective metabolites and neurotoxic intermediates. Given its involvement in neurodegenerative diseases and recent reports of alterations in the pathway in response to obesity, we set out to investigate the potential moderating effect of the kynurenine/tryptophan ratio (KTR) on the relationship between adiposity and verbal memory performance in midlife. Our study is important in providing insight into mechanisms underlying the association between adiposity and cognition through the life course and sheds light on the role of metabolic risk factors before senescence. With the current epidemic of obesity and the expected age-related increase in dementia incidence, even a small association between obesity and cognitive decline may have far-reaching public health implications.

Participants and Methods: A total of 110 middle-aged adults aged 40-61 years participated in this cross-sectional study. Serum levels of kynurenine and tryptophan, body adiposity measured through bioimpedance, and non-contextual verbal memory performance on the California Verbal Learning Test, Second Edition (CVLT-II) were evaluated. Using factor analysis, the composite score of memory indices from Short Delay Free Recall, Long Delay Free Recall, and Long Delay Recognition tasks were calculated. We used linear regression models with the interaction between KTR and adiposity. Sex, age, years of education, and physical activity were included as covariates, as they predict cognitive performance.

Results: Higher KTR was associated with greater adiposity ($p < 0.01$). Linear regression analyses for assessing interaction effects indicated that KTR moderated the relation between adiposity and composite memory score ($F(7, 100) = 5.22, p < 0.001, R^2 = 0.27$). These results were robust across individual memory indices and composite memory scores. These findings remained significant even with adjusting for relevant covariates. Interestingly, the marginal effects of adiposity on composite memory score were estimated to be statistically significant and negative (higher adiposity = poorer memory) only when KTR was low (< 0.03).

Conclusions: The present study indicates that KTR may influence the association between adiposity and verbal memory in midlife as KTR moderated the relationship between adiposity and composite memory score even after adjusting for relevant covariates. In contrast to the notion that high KTR is related to increases

in neurotoxic metabolites such as quinolinic acid, individuals with high adiposity and low KTR exhibited the weakest memory performance. Unfortunately, our study did not include measurements of quinolinic acid or kynurenic acid, which may have neuroprotective and anti-inflammatory properties. Future studies expanding the number of measured KT metabolites could shed light on the interactions between obesity and KTR on memory function in midlife.

Categories: Other

Keyword 1: cognitive functioning

Keyword 2: memory: normal

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1 Moral Reasoning in Individuals with Agenesis of the Corpus Callosum

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Objective: Previous research has demonstrated that individuals with Agenesis of the Corpus Callosum (AgCC), the congenital absence of all or part of the corpus callosum, exhibit a pattern of cognitive and psychosocial deficits, even with a FSIQ in the normal range (FSIQ > 80; Brown & Paul, 2019). This includes a core deficit in their complex reasoning and novel problem-solving (Brown & Paul, 2019), with secondary deficits in capacity to imagine complex emotional/cognitive consequences of potential actions involving others (Young et al, 2019), deficits in emotion

perception (Symington et al., 2010, Bridgman et al 2014), and difficulty with cognitively processing emotions within the context of social interactions (Anderson et al., 2017). This constellation of deficits is likely to also impact moral reasoning. While previous research has demonstrated differences in moral reasoning among other neuropsychological populations such as those with ventromedial prefrontal damage (Moretto et al., 2010) and frontotemporal dementia (Gleichgerrcht et al., 2011), there is no research reported regarding moral judgements in AgCC. This study employed the Moral Dilemmas Scale (Greene, 2001) to compare the moral judgements of persons with AgCC to neurotypical controls. It was predicted that individuals with AgCC would be less contextually nuanced than neurotypical controls in responding to moral dilemmas.

Participants and Methods: Results consist of data derived from 57 neurotypical control participants (ages 23 to 64 years) recruited from MTurk Cloud and 19 AgCC participants (ages 23 to 77 years) with normal-range FSIQ (>80) drawn from the individuals with AgCC involved with the Human Brain and Cognition Lab at the Travis Research Institute. All participants completed an online version of the Moral Dilemmas Scale (Greene, 2001). The scale consists of 25 dilemmas, of which 11 are considered high-conflict, 7 low-conflict and 7 impersonal. Participants were instructed to read each dilemma and rate whether they found the action to be “appropriate” or not. The high-conflict dilemmas share a similar structure in which responses reflect either a utilitarian or deontological judgement.

Results: “Approve” responses to each of the 3 categories of dilemma were separately tallied for each individual and subjected to a 2group ANOVA. Results revealed the control group produced a significantly higher rate of “appropriate” responses to high-conflict dilemmas than did the individuals with AgCC ($F=8.17$, $p = .006$, $\eta^2 = .113$). However, no significant differences were found among the two groups for results on low ($\eta^2 = .013$) and impersonal ($\eta^2 = .003$) dilemmas alone. Furthermore, a X2 analysis of responses to each high conflict dilemma revealed a significant difference in 5 out of the 11 such that more persons with AgCC gave a deontological judgement.

Conclusions: Results suggested that adults with AgCC respond similarly to neurotypical controls with respect to the low conflict or

impersonal dilemmas. However, with respect to high conflict dilemmas, compared to controls they tend to respond in a more deontological than utilitarian basis – that is, based on general principles without contextual nuance. These findings are consistent with the conclusion of Renteria-Vasquez et al. (2021) that persons with AgCC have difficulty imagining the wider implications of present information.

Categories: Behavioral Neurology/Cerebral Lateralization/Callosal Studies

Keyword 1: corpus callosum

Keyword 2: social cognition

Keyword 3: decision-making

2 The Contribution of Brain Metastases to Neurocognitive Functioning in Patients with Advanced Metastatic Cancer

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Objective: Neurocognitive decline is prevalent in patients with metastatic cancers, attributed to various disease, treatment, and individual factors. Whether the presence of brain metastases (BrMets) contributes to neurocognitive decline is unclear. Aims of this study are to examine neurocognitive performance in BrMets patients and compare findings to patients with advanced metastatic cancer without BrMets. Here, we present baseline findings from an ongoing, prospective longitudinal study.

Participants and Methods: English-speaking adults with advanced metastatic cancers were