5 LIfestyle for BRAin Health (LIBRA) Modifiable Factors Risk Score and Concussion History Associations with Cognition in Older Former National Football League Players.

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Objective: Traumatic brain injury is one of several recognized risk factors for cognitive decline and neurodegenerative disease. Currently, risk scores involving modifiable risk/protective factors for dementia have not incorporated head injury history as part of their overall weighted risk calculation. We investigated the association between the LIfestyle for BRAin Health (LIBRA) risk score with odds of mild cognitive impairment (MCI) diagnosis and cognitive function in older former National Football League (NFL) players, both with and without the influence of concussion history.
Participants and Methods: Former NFL players, ages ≥ 50 (N=1050; mean age=61.1±5.4-years), completed a general health survey including self-reported medical history and ratings of function across several domains. LIBRA factors (weighted value) included cardiovascular disease (+1.0), hypertension (+1.6), hyperlipidemia (+1.4), diabetes (+1.3), kidney disease (+1.1), cigarette use history (+1.5), obesity (+1.6), depression (+2.1), social/cognitive activity (-3.2), physical inactivity (+1.1), low/moderate alcohol use (-1.0), healthy diet (-1.7). Within Group 1 (n=761), logistic regression models assessed the association of LIBRA scores and independent contribution of concussion history with the odds of MCI diagnosis. A modified-LIBRA score incorporated concussion history at the level planned contrasts showed significant associations across concussion history groups (0, 1-2, 3-5, 6-9, 10+). The weighted value for concussion history (+1.9) within the modified-LIBRA score was based on its proportional contribution to dementia relative to other LIBRA risk factors, as proposed by the 2020 Lancet Commission Report on Dementia Prevention. Associations of the modified-LIBRA score with odds of MCI and cognitive function were assessed via logistic and linear regression, respectively, in a subset of the sample (Group 2; n=289) who also completed the Brief Test of Adult Cognition by Telephone (BTACT). Race was included as a covariate in all models.
Results: The median LIBRA score in the Group 1 was 1.6(IQR= -1, 3.6). Standard and modified-LIBRA median scores were 1.1(IQR= -1.3, 3.3) and 2(IQR= -0.4, 4.6), respectively, within Group 2. In Group 1, LIBRA score was significantly associated with odds of MCI diagnosis (odds ratio[95% confidence interval]=1.27[1.19, 1.28], p <.001). Concussion history provided additional information beyond LIBRA scores and was independently associated with odds of MCI; specifically, odds of MCI were higher among those with 6-9 (Odds Ratio[95% confidence interval]; OR=2.54[1.21, 5.32], p<.001), and 10+ (OR=4.55;[2.21, 9.36], p<.001) concussions, compared with those with no prior concussions. Within Group 2, the modified-LIBRA score was associated with higher odds of MCI (OR=1.61[1.15, 2.25]), and incrementally improved model information (0.04 increase in Nagelkerke R^2) above standard LIBRA scores in the same model. Modified-LIBRA scores were inversely associated with BTACT Executive Function (B=-0.53[0.08], p=.002) and Episodic Memory scores (B=-0.53[0.08], p=.002).
Conclusions: Numerous modifiable risk/protective factors for dementia are reported in former professional football players, but incorporating concussion history may aid the multifactorial appraisal of cognitive decline risk and identification of areas for prevention and intervention. Integration of multi-modal biomarkers will advance this person-centered, holistic approach toward dementia reduction, detection, and intervention.

Categories: Dementia (Non-AD)
Keyword 1: traumatic brain injury
Keyword 2: cardiovascular disease
Keyword 3: mild cognitive impairment

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6 The Relationship Between Inhibitory Control Impairment in Social Disinhibition Following Severe Traumatic Brain Injury

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Objective: Inhibitory control impairment is highly prevalent following traumatic brain injury (TBI). There have not been any empirical investigations into whether this could explain social disinhibition following severe TBI, i.e. socially inappropriate behaviour of verbal, physical or sexual nature. Further, social context has proven to be important in studying social disinhibition and using a social version of an established task for the assessment of inhibitory control may provide a new perspective. Therefore, the objectives of this research study were to investigate the role of inhibitory control impairment in social disinhibition following severe TBI, using a social and a non-social task. We hypothesized that people with TBI and clinical levels of social disinhibition would perform worse on both task versions, when compared to those with low disinhibition levels. Further, we hypothesized that participants high on social disinhibition would perform worse on the social, when compared to the non-social version.
Participants and Methods: We conducted a between-group comparative study. Twenty-six adult participants with severe TBI were matched with 27 adult, healthy controls based on gender, age and education. Frontal Systems Behavior Scale and Social Disinhibition Interview were used to assess social disinhibition. A computerized task based on the cued go/no-go paradigm was used to assess inhibitory control. We included two versions of this task – a coloured (non-social) Go/No-Go with different colored rectangles, and an emotional (social) Go/No-Go with emotional faces serving as ‘go‘ and ‘no-go‘ cues. Two-way mixed ANCOVAs were used to test between-group differences in errors of commission and response speed.
Results: Unexpectedly, the TBI and the control group did not significantly differ on their levels of depression, anxiety, stress, or their level of social disinhibition. Overall, participants were slower ($F(1,47) = 15.212$, $p<.001$, $\eta p2 = .245$) and made more errors of commission on no-go trials ($F(1,44) = 11.560$, $p = .001$, $\eta p2 = .208$) on the social Go/No-Go task. There was no main effect of participants‘ brain injury status on errors of commission on no-go trials or mean reaction times. When categorized based on disinhibition level (high vs low), participants in the high-disinhibition group made more errors on the social task ($F(1,41) = 4.095$, $p = .050$, $\eta p2 = .091$) than those in the low-disinhibition group, and more errors on the social, compared to the non-social task (task-group interaction ($F(1,41) = 7.233$, $p = .010$, $\eta p2 = .150$)).
Conclusions: Based on these initial results, social disinhibition is associated with inhibitory control impairment, although this is only evident when a social inhibitory control task is used for assessment. We did not find any relationship between social disinhibition and the speed with which people react to stimuli. The results of this study add to the conceptualization of social disinhibition that is commonly present after severe TBI.

Categories: Social Cognition
Keyword 1: disinhibition
Keyword 2: inhibitory control
Keyword 3: traumatic brain injury
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Paper Session 06: Epilepsy related topics

2:15 - 3:45pm
Thursday, 2nd February, 2023
Town & Country Ballroom D

Moderated by: Natasha Ludwig

1 Network Efficiency as Structural Reserve: Pre- And Post-Operative Associations Between Network

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