



Mild Head Injury: A Predictor of Impulsive Antisocial Behaviour

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Background

Mild head injury (MHI) is a serious cause of neurological impairment as an estimated 8 million individuals incur a head injury annually in the United States alone¹. Of the approximately 1.5 million individuals who survive a head injury, as many as 75-80% of these cases are diagnosed as “mild”². Unfortunately, a substantial percentage (15%) of individuals with a MHI remain symptomatic 1-year following their injury³.

The neurobehavioural profile of orbitofrontal injury (common after impact injuries) predominantly consists of marked impairments in decision-making⁴ and impulsive antisocial behaviour⁵. These individuals tend to make risky decisions due to their inability to prospectively determine the outcome of their actions and their inability to withhold impulses.

The relation between MHI and impulsive antisocial behaviour remains unclear due to an overall paucity of research in the field. Furthermore, the relation between performance on measures of executive functioning and impulsive antisocial behaviour in university students with and without a history of MHI has yet to be examined.

Purpose

To examine whether MHI status is differentially predictive of impulsive antisocial behaviour in university students.

To examine whether measures of executive functioning are predictive of impulsive antisocial behaviour.

Method

Participants

University students ($N = 90$) participated in neuropsychological testing sessions; 52% incurred a MHI

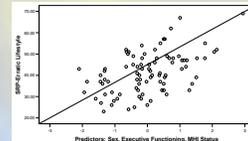
Measures and Procedure

Standardized neuropsychological tests and self-report questionnaires were administered, including:

- Executive Functioning:
 - Comprehensive Test of Nonverbal Intelligence (CTONI): Pictorial Analogies
 - Wechsler Memory Scale III (WMS-III): Letter-number Sequencing; Mental Control
 - Delis-Kaplan Executive Functioning Scale (DKEFS): Stroop; Trail Making Test
 - NEPSY: Auditory Attention and Response Set
- Antisocial Behaviour: Self-Report Psychopathy Scale III R11 (SRP III R11)
- Self-report of a MHI: Demographic Questionnaire

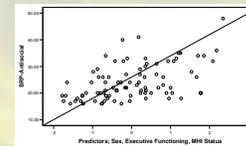
Results

Sex was entered on Step 1; All executive functioning measures on Step 2; MHI status on Step 3



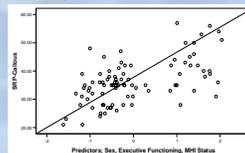
Outcome: Erratic Lifestyle

1. Sex ($R^2 = .09$, $sr = -.29^{**}$)
2. Executive functioning ($\Delta R^2 = .10$, CTONI score: $sr = -.22^*$)
3. MHI status ($\Delta R^2 = .07$, $sr = .27^{**}$)



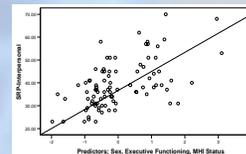
Outcome: Antisocial Behaviour

1. Sex ($R^2 = .11$, $sr = -.33^{**}$)
2. Executive functioning ($\Delta R^2 = .06$, $sr = n.s.$)
3. MHI status ($\Delta R^2 = .09$, $sr = .29^{**}$)



Outcome: Callous Affect

1. Sex ($R^2 = .27$, $sr = -.52^{**}$)
2. Executive functioning ($\Delta R^2 = .04$, $sr = n.s.$)
3. MHI status ($\Delta R^2 = .02$, $sr = n.s.$)



Outcome: Interpersonal Manipulation

1. Sex ($R^2 = .23$, $sr = -.48^{**}$)
2. Executive functioning ($\Delta R^2 = .02$, NEPSY $sr = .29^{**}$)
3. MHI status ($\Delta R^2 = .02$, $sr = n.s.$)

* $p < .05$, ** $p \leq .01$

Discussion

As expected, men were more antisocial than women in general. Interestingly, executive dysfunction (specifically CTONI) was a significant predictor of Erratic Lifestyle after controlling for Sex, whereas better executive functioning (specifically NEPSY-B) predicted Interpersonal Manipulation. However, executive functioning did not predict Callous Affect or Antisocial Behaviour. As predicted, MHI status accounted for a significant amount of variance above and beyond sex and executive functioning *only on Erratic Lifestyle and Antisocial Behaviour*. Therefore, MHI status differentially predicted impulsive antisocial behaviour.

Conclusions

These results mirror previous research findings investigating impulsive antisocial behaviour as a consequence of focal orbitofrontal injury. Executive functioning is negatively correlated with impulsive antisocial behaviour and is positively correlated with instrumental antisocial behaviour. Furthermore, individuals with a history of MHI exhibit more impulsive antisocial behaviour than matched controls; however, this form of antisocial behaviour is manifested more subtly than more severely injured frontal lobe patients. Moreover, the inability to modulate impulses and to make adaptive decisions has the potential for maladaptive consequences even in high-functioning populations, such as university students. Ultimately, these results indicate that the cognitive and behavioural sequelae following MHI have neural underpinnings that might not necessarily be transient in spite of clinical opinion.

References

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