The Burden of New-Onset Psychiatric Disorders Following Traumatic Brain Injury

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Background

- Traumatic brain injury (TBI) rates are increasing worldwide.
- There are 165,000 serious brain injuries/year in Canada.
- New-onset psychiatric disorders (NPD) are one of the common sequelae of traumatic brain injury.



- Risk factors of NPDs include age, sex, previous psychiatric history, socioeconomic factors,.
- In TBI patients, injury severity has also shown to be associated with NPDs.
- Most studies to date include small samples and lack controls.

Research Questions

1. What is the prevalence of NPDs in TBI patients in the first two years after injury?
2. What is influence of TBI on the development of NPDs?

Outcomes

NPD-A

A new-onset psychiatric disorder in a patient in the absence of a psychiatric history

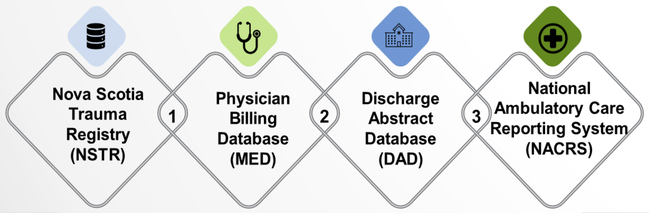
NPD-P

A new-onset psychiatric disorder in a patient in the presence of a psychiatric history

Data Sources and Linkage

The study population was obtained from the Nova Scotia Trauma Registry. Patients diagnosed with a TBI between 2002-2019 were included.

Patient's health card number was used for data linkage with three health administrative databases to capture mental health diagnoses. ICD-9 and ICD-10 codes corresponding to mental health diagnoses in the two years pre- and post-injury were obtained from the Physician Billing Database, Discharge Abstract Database (DAD), and the National Ambulatory Care Reporting System (NACRS).



NSTR
Data source: Nova Scotia Trauma Registry

Study cohort: TBI patients between April 1, 2002 - March 31, 2019.

Linkage
Study cohort data linked by Health Data Nova Scotia to:
- Physician billing
- DAD
- NACRS

MED
Physician billing records for community setting or emergency department visits.

ICD-9 codes 230-319

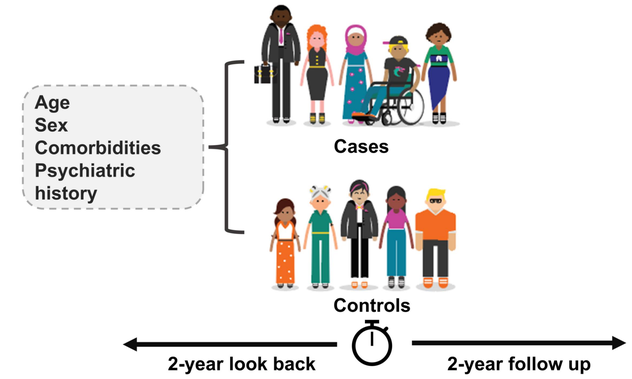
DAD
Provincial hospitalizations for mental health disoders.

ICD-10 codes F04-99

NACRS
Provincial emergency department visits for mental health disorders.

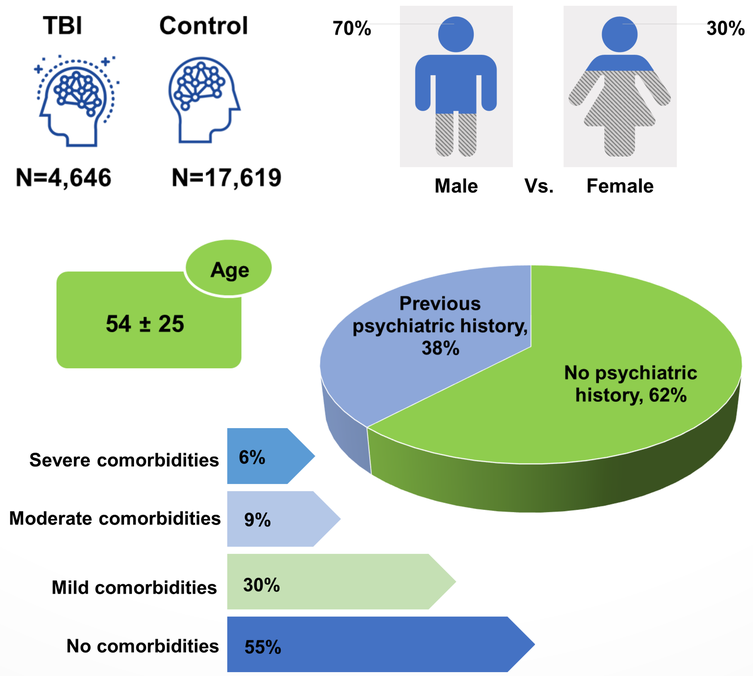
ICD-10 codes F04-99

Methodology



- Controls were obtained from the insured patient registry. Controls did not have a TBI diagnosis between 2002 - 2019, as well as during the follow-up period.
- TBI cases were propensity matched to controls (1:4) on age, sex, categories of the Charlson comorbidity index, and psychiatric diagnoses.
- Logistic regression was used to calculate the propensity score using a caliper matching of width 0.2 standard deviations of the logit of propensity score.
- The prevalence of NPD during follow-up was compared between the TBI and control groups using the chi-square test.
- Conditional regression analysis was used to evaluate the relationship between the TBI and the outcomes of interest.

Results



Results

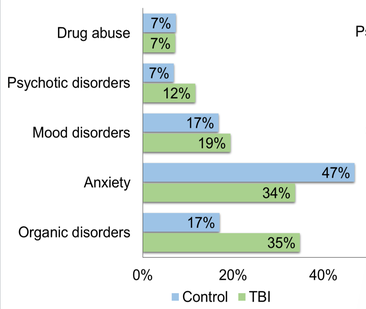
Prevalence and comparison of NPDs

	TBI	Control	P-value
NPD-A	17.6%	10.7%	<0.001
NPD-P	60%	46%	<0.001

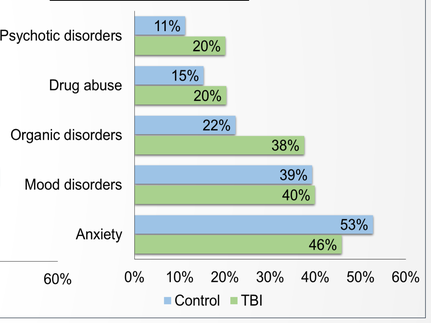
Results of conditional logistic regression

	Odds ratio	95%CI	P-value
NPD-A	1.82	1.65-2.00	<0.001
NPD-P	1.69	1.44-1.98	<0.001

Common NPD-A disorders



Common NPD-P disorders



Conclusions

- This is the largest population-based study of matched TBI cases and controls investigating the role of TBI on psychiatric outcomes after injury.
- TBI patients are at higher odds of developing NPD-A and NPD-P when compared with matched controls.
- These findings suggest that continued monitoring and screening for the development of NPDs within the first 24 months after injury can lead to early identification of NPDs in TBI patients.

Future Work

- Demographic and socioeconomic factors may influence the development of NPDs after TBI and understanding these risk factors may allow for stratification and management of patient risk.
- Ongoing analysis within this project will seek to understand the effect of age, sex, injury severity, and socioeconomic factors on NPDs after TBI.

Acknowledgments

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