Persistent Pain Following Traumatic Brain Injury

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Introduction

• Traumatic brain injury (TBI) is a leading cause of pediatric disability in the United States.
• Persistent pain has been recognized as a significant comorbidity in adults with TBI, but data in adolescents is limited.
• Headache is the most frequently reported pain following TBI, and often conceptualized as a component of post-concussive syndrome.
• To our knowledge, no studies have described pain in other sites or examined for persistent pain following pediatric TBI.

Aims

1. Examine the prevalence of pain and persistent pain over 36 months post TBI
2. Identify the risk factors for persistent pain
3. Examine the impact of persistent pain on long term health related quality of life (HRQOL)

Methods

Design: Secondary analyses of a 36-month longitudinal study, Child Health After Injury that examined disability in children with TBI.
Procedures: Adolescents completed measures at baseline, 3, 12, 24, and 36 months after TBI.
Measures:
- Pain intensity: Numerical rating scale (0-10) in the past week
- Pain locations: Adolescents reported on the head, face, neck, chest, back, abdomen, pelvis, upper and lower limbs. Persistent pain was defined as pain at 3,12, 24, & 36 months.
- Depressive symptoms: Personal Health Questionnaire Depression Scale (PHQ-9)
- Posttraumatic stress symptomatology (PTSD): UCLA PTSD Reaction Index
- Health related quality of life (HRQOL): Pediatric Quality of Life Inventory (PedsQL)

Analyses

• Descriptive data on prevalence of pain and pain characteristics.
• T-tests and chi-square analyses examined group differences in demographic and clinical factors between adolescents with 36-month persistent pain (persistent pain group) and adolescents without no persistent pain (infragroup pain group).
• A logistic regression model examined for predictors of 36-month persistent pain with covariates of age, sex, TBI severity, and depressive symptoms at 3 months after TBI.
• A linear mixed model examined for predictors of longitudinal HRQOL over 36 months. Predictors included age, sex, TBI severity, pain intensity at 3 months, depressive and PTSD symptomatology.

Results

• TBI Severity: Mild TBI defined as worst Glasgow Coma Scale (GCS) of13-15 at initial evaluation; moderate TBI, worst motor GCS of 4-6; severe TBI, worst motor GCS of 1-3.
• Other injury severity: Maximum Abbreviated Injury Scale (MAxAIS) of non-head injury, higher scores indicate increased severity.

- 18 adolescents completed baseline assessment, with 144 assessed at all time points (males 69.4%, mean age=15.7yrs). 119 (82.8%) had mild TBI, 22 had moderate TBI (15.2%), 3 (2.0%) had severe TBI.
- There were more females in persistent pain group (54.3%) vs. infrequent pain group (22.9%, p<.001).
- No significant differences between persistent pain and infrequent pain groups by age, TBI severity, MAxAIS, race, ethnicity, socioeconomic or insurance status.

Conclusions

- Findings suggest that a significant proportion of adolescents reported persistent pain up to 36 months after TBI involving headache and non-headache pain.
- Furthermore, HRQOL was negatively impacted, particularly in adolescents with moderate/severe TBI and persistent pain.
- Results suggest that clinical assessment should include evaluation for persistent pain and its risk factors. This may provide opportunities for targeted intervention to minimize pain and improve the quality of life for adolescents following TBI.