A Prospective Study: Post Traumatic Headache, Fatigue, and Depression following Mild or Moderate Traumatic Brain Injury

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Prevalence of Headache, Fatigue, Depression Following TBI

- Traumatic brain injury (TBI) is the leading cause of death and disability for Canadians under 45\textsuperscript{1}

- Headache and Fatigue are two of the most common complaints in patients with mild or moderate TBI. \textsuperscript{2-3}

**Headache:**
- 53.7% of patients who experienced a headache immediately following their injury were still symptomatic at 6 months post-injury.\textsuperscript{4}
- 96% of patients who were symptomatic at 6 months post-injury were still symptomatic at 12 months post-injury. \textsuperscript{4}

**Fatigue:**
- Two years post-TBI, 68% of patients continued to experience fatigue\textsuperscript{5}
- Five years post-TBI, 73% of patients continued to experience fatigue\textsuperscript{5}

**Depression:**
- 29% of patients with headaches following severe TBI suffered from depression\textsuperscript{6}

\textsuperscript{1}National Center for Injury Prevention and Control. Traumatic Brain Injury. Centers for Disease Control and Prevention [serial online] 2010
Objective

Patients suffering from the debilitating effects of headaches and fatigue may experience severe cognitive dysfunction, suffer mental health issues, have difficulty performing daily living activities, and a lowered quality of life.

The purpose of this study was to investigate the incidence and characteristics of headache, fatigue, and depression in patients who have sustained a mild or moderate TBI.
Methods

- A convenience sample of patients (n=179) who were at least 6 months post-TBI, attending St Michael’s Hospital’s Head Injury Clinic in Toronto, Ontario, were recruited.

- Participants’ demographic, injury, and general health information were collected.

- The Rivermead Post Concussion Symptoms Questionnaire (RPQ)\(^1\), Fatigue Severity Scale (FSS)\(^2\), and Patient Health Questionnaire-9 (PHQ-9)\(^3\) were also collected.

- Participants who endorsed having headaches on the RPQ also completed a Headache Specific History\(^4\) and the Migraine Disability Assessment Tool (MIDAS)\(^5\).

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4. The Headache Specific History was developed by Neurologist and headache expert, Dr. Jonathan Gladstone. Dr. Gladstone, MD, FRCPC is Director of Gladstone Headache Clinic; Director of Neurology and Headache Medicine, Cleveland Clinic Canada; Headache Specialist, Sunnybrook Health Sciences Center; Co-Director of Headache Clinic, the Hospital for Sick Children; and Headache/Neurology Specialist, Head and Neck Injury Clinic, Toronto Rehabilitation Institute.
Demographic Results

- 179 patients were recruited to the study

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Response</th>
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<tbody>
<tr>
<td>Age</td>
<td>43.7 ± 12.6 years [range 18-79]</td>
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<tr>
<td>Gender</td>
<td>49.2% [n=88] Male 49.2% [n=88] Female</td>
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<tr>
<td>Time Since Injury</td>
<td>35 months post-TBI [range 6 months-19 years]</td>
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Mechanism of Injury

- Motor Vehicle Collision: 39%
- Fall or Hit by an Object: 21%
- Sports: 8%
- Pedestrian: 5%
- Suicide Attempt: 1%
- Work-Related: 2%
- Other: 5%
- Two or More Indicated: 12%
- Violence: 3%
- Bicycle: 4%
Headache Results

- Based on the RPQ, 82.6% (n=148) indicated headaches to be a mild, moderate or severe problem.

- 86% (n=143) of participants had more than one location of headache pain.

- Top 5 Headache Triggers:
  1. Stress (60.2% [n=112])
  2. Lack of sleep (54.8% [n=102])
  3. Loud sounds (51.6% [n=96])
  4. Bright lights (51.1% [n=95])
  5. Fatigue (47.3% [n=88])

- On a scale from 0-10 where 0 is no pain at all and 10 is pain as bad as it can be, most patients ranked their headaches, on average, at a 6.55.
Headache Results

**Severity of Headaches**

- Mild
- Moderate
- Severe
- Incapacitating

**Ability to Function**

- Male
  - Function Normally
  - Functioning is Slightly Decreased
  - Functioning is Severely Decreased
  - Totally Bedridden

- Female

- Milder Headaches
- Moderate to Severe Headaches

Without Medication
With Medication
Based on the RPQ, 88.8% (n=159) indicated fatigue to be a mild, moderate or severe problem.

80.4% (n=144) scored ≥36 on the FSS (suggesting the presence of fatigue).

“Fatigue is One of my Three Most Disabling Symptoms”
Fatigue Results

- Patients suffering from fatigue reported frequent problems sustaining motivation (93.2% [n=138]) and physical functioning (82.9% [n=121]).

- 89.8% (n=133) of patients reported that they were easily fatigued and 83.7% (n=124) of patients reported that fatigue causes them frequent problems.

"Fatigue Interferes with Carrying Out Certain Duties and Responsibilities"

- Agree 93%
- Neutral 5%
- Disagree 2%

"Fatigue Interferes with my Work, Family or Social Life"

- Agree 92%
- Neutral 5%
- Disagree 3%
Depression Results

- Average PHQ-9 scores were **13.7 ± 6.7** for females, and **12.5 ± 6.9** for males.

- PHQ-9 scores ≥ 10 indicate moderate depression.

Results

Fatigue scores as measured by the FSS correlated with patients suffering from headaches \((r = .247, p < .001)\)

Patients with headaches were more likely to have a PHQ-9 score \(\geq 12\) indicative of major depression in the population; \(\chi^2(4, N = 169) = 18.085, p < 0.01\)

Only FSS scores were significantly different between the sexes \((t(170) = -2.17, p = 0.026)\)
Conclusions

The majority of patients with mild to moderate TBI who presented to an outpatient TBI clinic report symptoms of headache, fatigue, and depression impacting quality of life and mental health.

A better understanding of factors (e.g. demographics, injury characteristics, medication compliance) leading to persisting headache and fatigue is warranted.

This high incidence of patients has confirmed the necessity to conduct large-scale trials to implement and evaluate interventions for the management of headaches in the TBI population.
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