Effect of Mobility on Community Participation at 1 year Post-Injury in Individuals with Traumatic Brain Injury (TBI)

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Introduction

• 5.3 million individuals are living with long-term disability due to a TBI in the US.
  – Unemployment
  – Changes in family dynamics
  – Social Isolation
  – Physical disability
  – Secondary health issues
Introduction

• Impaired motor, balance and cognitive functions following a TBI may result in a person becoming dependent on another’s assistance with walking.

• The loss of independent walking is perceived as the most disabling consequence following a stroke. …But what about the TBI population?
Objectives

• Describe how mobility changes over the course of time following a traumatic brain injury.

• Describe how mobility may influence different aspects of the individual’s life following a traumatic brain injury.
Methods

• Observational study using prospectively collected data from a TBI Model Systems center
  – Northern New Jersey Traumatic Brain Injury System
  – Information is collected at 1, 2, 5 and every 5 years after that.
  – **Moderate to Severe TBI:**
    • PTA > 24 hours
    • Trauma related abnormalities on the CT scan
    • Loss of Consciousness > 30 min
    • GCS <13 at time of injury
  – Admission into acute care hospital within 72 hours of injury and into acute inpatient rehab hospital within 72 hours of discharge from hospital
Methods

• **Setting:** Acute Inpatient Rehabilitation Hospital (AIRH) and community

• **Procedure:** A structured interview and assessments were conducted with the patient or surrogate while in AIRH and in the community at 1 year post discharge from AIRH.
Measures

Mobility: FIM™ – Walking Item

• Rating dependent upon level of **assistance** and **distance** walked.

• Ranges from 1 (total assistance required or walks less than 50ft) to 7 (walks independently without a device AND for at least 150ft).
Measures

Supervision Rating Scale (SRS)

- "Supervision" = someone is responsible for being with the participant.
- Ranges from 1 (independent) to 13 (full time direct supervision required).

Disability Rating Scale (DRS)

- 8-item measure of disablement (eye opening, communication, motor response, feeding, toileting, grooming, level of functioning, and employability).
- Maximum score is 29, indicating extreme vegetative state.
Measures

Participation Assessment with Recombined Tools (PART)

- 17-item questionnaire measuring frequency of engagement in community activities.

- PART Total Summary Score was used as a measure of community participation.

- Item 8 was used to identify individuals who did not leave their homes on a daily basis.

  In a typical week, how many days do you get out of your house and go somewhere? It could be anywhere – it doesn’t have to be anyplace “special”.

Measures

Satisfaction With Life Scale (SWLS)

• 5-item, global self-report measure of subjective well-being.
  1. In most ways my life is close to my ideal.
  2. The conditions of my life are excellent.
  3. I am satisfied with my life.
  4. So far I have gotten the important things I want in life.
  5. If I could live my life over, I would change almost nothing.

• Items are rated on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

• The total score ranges from 5 to 35 in which higher numbers indicate greater satisfaction with one’s life.
Participants

Total Sample

• **245** patients admitted to AIRH with TBI
• **156** (63.7%) *moderate*, **88** (35.9%) *severe*
• Ages ranged between **16 and 92** years old
• Mean LOS in acute hospital = **16.19 days** (SD ±13.7)
• Mean LOS in AIRH = **24.60 days** (SD ± 17.34)
### Participants

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Participants

Sample was divided into 2 groups based on walking status.

- At admission and discharge from AIRH
  - Independent Ambulator: FIM™-Walking = 6 or 7
  - Dependent Ambulator: FIM™-Walking ≤5

- 1 year post-injury - revised criteria to capture decline in function
  - Independent Ambulator: FIM™-Walking = 6 or 7 AND same or better than at discharge
  - Dependent / Declining Ambulator: FIM™-Walking ≤5 OR worse than at discharge.
Changes in Mobility Over Time

Figure 1: Walking at Admission
- 100% Independent

Figure 2: Walking at Discharge
- 39% Dependent
- 61% Independent

Figure 3: Walking at 1 Year Post-Injury
- 15% Dependent/Declining
- 85% Independent
Impact of Mobility at 1 Year Post Injury

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<td>Age at Injury*</td>
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<td>SWLS*</td>
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![Bar chart showing percentage of highest possible score for different measures (SRS, DRS, PART, SWLS) between dependent and independent ambulators.](image-url)
Causes of TBI by Age Group

CDC
Conclusion

Individuals dependent on someone’s assistance with walking…

• Had a greater need for supervision

• Had higher rates of disability

• Were less likely to leave their homes and engage in community-based activities.

…and this may have contributed to their self-reported lower levels of life satisfaction.
Clinical Implications

Clinicians should consider ways to prevent the decline in walking ability.

• Find ways to promote walking
  – Activity monitors
  – Goals

• Incorporate interventions that improve independence with walking--- improve balance?

• Identify barriers that preclude community participation
Limitations

• Possible ceiling effect in FIM for categorizing mobility
  – Gait speed
  – Gait endurance
  – Balance measure
  – Activity Monitor

• Did not account for injuries that may restrict mobility in the early stage (i.e. fractures)

• Cognitive function- the need for supervision

• Results may not apply to a younger sample or to individuals outside this region (e.g. urban environments)
Future Research

• Use an outcome measure that better captures components of walking in the community for independent ambulators.

• Investigate interventions to improve independence with walking and identify environmental barriers that limit community participation.

• Explore the causes behind why certain patients are showing a decline in function.
Thank you!

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Questions?
References


