Traumatic Brain Injury: Psychiatric Comorbidities

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Public Workshop
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Outline: Focus on PTSD and Depression

- Epidemiology of comorbidities
- Potential Mechanisms/Causal Pathways
- Impact on Treatment Options?
2008 IOM Report on Long-Term Effects of TBI: Psychiatric Findings

- Depression: sufficient evidence
- Aggression: sufficient evidence

PTSD, civilian: inadequate, insufficient
PTSD, military: limited, but suggestive (mild TBI)

Psychosis: limited, but suggestive (mod, severe TBI)
Drug/alcohol (decreases): limited, but suggestive
OEF/OIF Comorbidity: TBI, PTSD, Depression

RAND study - Tanielian & Jaycox (2008)

N = 1965
Phone survey; self report screening measures
Random digit dialing; weighted analyses

19.5 % TBI; 13.8% PTSD; 13.7% depression

If TBI: 33.8% PTSD
31.8% major depression
### OEF/OIF Comorbidity

**Hoge et al. (2008; NEJM)**

N = 2525 Army infantry, 3-4 months post-return
Self-report screening measures

<table>
<thead>
<tr>
<th>Condition</th>
<th>PTSD</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>If TBI + LOC</td>
<td>44%</td>
<td>23%</td>
</tr>
<tr>
<td>If TBI + altered consc.</td>
<td>27%</td>
<td>8%</td>
</tr>
<tr>
<td>If non-TBI injury</td>
<td>16%</td>
<td>7%</td>
</tr>
<tr>
<td>If no injury</td>
<td>9%</td>
<td>3%</td>
</tr>
</tbody>
</table>
Pain and TBI

Nampiaparampil (2008; JAMA) review; N = 23 studies

Headache prevalence: 57.8%
Chronic pain prevalence: 51.5%
Veteran pain prevalence: 43.1%

More in mild TBI, depression, PTSD

Dobscha et al. (2009; Pain Med) review; N = 93 studies

Factors assoc. with pain in TBI:
  severity?
symptoms (insomnia, fatigue)
depression, PTSD
TBI and PTSD/Depression

- Combat
- Injury Events
- TBI
- PTSD/Depression
Overlapping Associated Symptoms

PTSD
- Re-experiencing
- Shame
- Guilt

++
- Depression
- Anxiety
- Insomnia
- Irritability/Anger
- Poor Concentration
- Fatigue
- Hyperarousal
- Avoidance

Persistent Post-concussive Syndrome
- Headache
- Sensitivity to Light
- Memory Deficit
- Dizziness

OEF/OIF Comorbidity

Schneiderman et al. (2008; Am J Epi)

N = 2235 OEF/OIF veterans
Limited geographic region
Self-report screening measures

After removing shared PTSD/PCS symptoms:

PTSD was the strongest predictor of PCS (prevalence ratio $= 3.79$; CI $= 2.57$, 5.59)
Longitudinal Prediction of Psychiatric Status Following TBI

Bryant et al. (2010; Am J Psych)

n = 1084 civilians with traumatic injuries
Assessed during hospitalization, 3 mos., 12 mos.
Structured interviews

New onset disorders at 12 months:

<table>
<thead>
<tr>
<th></th>
<th>mild TBI</th>
<th>Non-TBI injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD</td>
<td>7.4%</td>
<td>4.5%</td>
</tr>
<tr>
<td>GAD</td>
<td>6.1%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Agoraphobia</td>
<td>7.1%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Depression</td>
<td>7.1%</td>
<td>10.3%</td>
</tr>
</tbody>
</table>
Longitudinal Prediction of Psychiatric Status Following TBI

At 12 mos., mild TBI patients ~2x more likely to develop new:

<table>
<thead>
<tr>
<th></th>
<th>Adj OR</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD</td>
<td>1.92</td>
<td>1.08, 3.40</td>
</tr>
<tr>
<td>Panic</td>
<td>2.10</td>
<td>1.03, 4.14</td>
</tr>
<tr>
<td>Social Phobia</td>
<td>2.07</td>
<td>1.03, 4.16</td>
</tr>
<tr>
<td>Agoraphobia</td>
<td>1.94</td>
<td>1.13, 3.39</td>
</tr>
</tbody>
</table>

Functional impairment related to psychiatric status.
TBI Severity and PTSD

- Zatzick et al. (2010; Arch Gen Psych)

N = 3047 civilians (weighted N = 10,372)
TBI chart abstracted; PTSD screened by checklist at 12 mo.

Only moderate and severe TBI decreased risk of PTSD, compared to other injury controls

<table>
<thead>
<tr>
<th>Severity</th>
<th>OR</th>
<th>CI</th>
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<tbody>
<tr>
<td>mild</td>
<td>0.83</td>
<td>0.61, 1.13</td>
</tr>
<tr>
<td>moderate</td>
<td>0.63</td>
<td>0.44, 0.89</td>
</tr>
<tr>
<td>severe</td>
<td>0.72</td>
<td>0.58, 0.90</td>
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</table>

PTSD assoc. with functional impairment, cognitive symptoms.
Psychosocial Treatments for PTSD (and Related Disorders)

- Does TBI contraindicate treatment?
- Does TBI influence treatment response?
- Can PTSD treatment be augmented with cognitive rehabilitation?
Psychosocial Interventions: Favorable Outcomes in TBI Patients


  RCT showed that CBT for acute stress disorder after mTBI assoc with reduced PTSD 6 months later.

- CBT beneficial following mTBI for range of emotional concerns (Soo & Tate, 2007 review)
Non-TBI Cognitive Deficits and Diminished PTSD Tx Response

- Wild & Gur (2008) (n = 23)
  Lower pre-treatment verbal memory attenuated response to CBT (for PTSD)

- Rizvi, Vogt, & Resick (2009) (n = 145)
  Lower pre-treatment IQ greater early drop out rate in CBT RCT.
Summary

- Mood, anxiety, and pain common, especially in mild TBI.
- PTSD more common in veterans; civilian literature may diverge according to sports versus non-sports injury.
- Psychiatric comorbidity associated with poorer functional outcomes and, in mTBI, PCS.
- Little evidence addressing effects of comorbidity on treatment outcomes.
Thank you