Head Injuries During Assaults Against Women: Implications for Recovery from PTSD

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Thank you

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Survivors of interpersonal assaults from St. Louis, MO
Prevalence and Costs of IPV

Across a number of studies, lifetime prevalence rates of IPV range from 15-50% for women.

Estimates vary widely because questions are phrased differently across studies.

Leading cause of injury for women in US*

(*Grisso et al. 1991 Epidemiology)
For those of you who work with veterans…

Iverson et al. (2017, Comprehensive Psyc) just published a web-based study of national sample of 411 women veterans

- Screened for IPV-related TBI, current IPV, current TBI symptoms, and PTSD.
- 55% reported lifetime IPV. Of those, 28% met criteria for IPV-related TBI. 12.5% had current post-concussive symptoms.
With regard to PTSD

- IPV with current TBI symptoms related to PTSD symptoms: (79% intrusion; 83% avoidance; 86% cognition/mood; 89% arousal)
- IPV-related TBI w/o current symptoms: (37%, 40%, 31%, 34%)
- IPV but no TBI: (29%, 30%, 33%, 28%)

First group- all significant differences with second and third groups.
Head Injury and Interpersonal Violence

Although research on head injury secondary to combat, sports, and vehicular accidents is burgeoning, far less is known about the extent and effects of similar injury incurred during violent assaults.1,2,3,4,5

Studies on brain injury with female participants are fewer in number relative to those with males.4,5

Literature specifically examining sex differences in brain injury is sparse: of 9822 studies on “brain injury”, only 9 studies reported sex differences.

1Farace, et al., 2000; 2Kwako et al., 2011; 3Jackson, et al., 2002; 4Valera et al., 2003; 5Zieman, et al., 2016
Let’s consider domestic violence…

Despite the fact that domestic violence is a **public health epidemic**, (numbers of DV survivors dwarf the number of military and athletes suffering from head injuries combined\(^1,5\)), survivors of DV have been understudied.

- Head injuries are the most common injury reported by women (88%) experiencing DV\(^2,3\)
- Likely to occur over multiple incidents\(^2,3,4,5\)
- Unlikely to be reported or treated in medical settings (perhaps 75% undetected)\(^2,3,4,5\)
- Likely to have been perpetrated by an intimate assailant\(^2,4,\)

\(^1\)Farace, et al., 2000; \(^2\)Kwako et al., 2011; \(^3\)Jackson, et al., 2002; \(^4\)Valera et al., 2003; \(^5\)Zieman, et al., 2016
Between 2001-2014, three successive clinical trials were conducted to assess the efficacy of Cognitive Processing Therapy (CPT) on survivors of interpersonal violence.

We’ve combed back through data from these clinical trials to assess:

- The extent of trauma reported by these survivors
- The extent of injury reported during these assaults
- The number and type of head injuries
- The influence of those head injuries on the course of recovery
Cognitive Processing Therapy: An Evidence-based Treatment for PTSD

- Cognitive theoretical perspective
- Can be conducted within group or individual format
- Typically about 12 sessions conducted on a weekly or twice-weekly basis with many opportunities for continued work outside the session.
496 adult participants were screened for PTSD secondary to interpersonal violence (required, although people could report additional traumas)

- 37 years of age
- 15.25 years since their index event
- 13.25 years of education
- 84% female
- Race: 42% African-American, 49% White, 9% other
- 49% single, 19% married/cohabitating, 25% divorced/separated
- Annual Income: <$5,000: 25% $5k - $20K: 34%
Measures

- Clinician Administered PTSD Scale – DSM-IV
- Beck Depression Inventory II
- Lifetime Trauma Survey
- Trauma Interview
  - Identified Index Trauma
  - Assessed injury during index event
  - Assessed injuries which occurred during other lifetime assaults
Question 1

What is the extent of trauma exposure in this sample?
## Exposure to Traumatic Events: The Index Trauma (worst event to start tx)

<table>
<thead>
<tr>
<th>Identified Index Trauma</th>
<th>N/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood Sexual Assault</td>
<td>195 (40%)</td>
</tr>
<tr>
<td>Childhood Physical Abuse</td>
<td>45 (9.2%)</td>
</tr>
<tr>
<td>Adult Sexual Assault</td>
<td>120 (24.6%)</td>
</tr>
<tr>
<td>Adult Physical Assault</td>
<td>124 (25.5%)</td>
</tr>
</tbody>
</table>
In addition to the index trauma...

<table>
<thead>
<tr>
<th>Additional Trauma Exposures</th>
<th>N/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childhood sexual trauma (contact)</td>
<td>349 (73%)</td>
</tr>
<tr>
<td>Chronic CSA (range: 12 -100s)</td>
<td>302 (64.3%)</td>
</tr>
<tr>
<td>Childhood Physical Trauma</td>
<td>301 (64%)</td>
</tr>
<tr>
<td>Adult Sexual Trauma</td>
<td>307 (47.6%)</td>
</tr>
<tr>
<td>Adult Physical Assault</td>
<td>361 (56%)</td>
</tr>
<tr>
<td>Domestic Violence</td>
<td>287 (58.7%)</td>
</tr>
</tbody>
</table>
Question 2 & 3

What is the extent of injury reported during attacks? How many of the injuries are consistent with “significant head injury”? 
# Non-Head Injuries

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Index Trauma</th>
<th>Injuries from other assaults 1 - 3 times</th>
<th>Injuries from other assaults 4 - 50+ times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruises on body</td>
<td>42.6%</td>
<td>16.7%</td>
<td>43.9%</td>
</tr>
<tr>
<td>Broken bones</td>
<td>5.8%</td>
<td>13.3%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Cuts</td>
<td>24.1%</td>
<td>16%</td>
<td>16.9%</td>
</tr>
<tr>
<td>Burns</td>
<td>4.6%</td>
<td>8.6%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Miscarriage</td>
<td>2%</td>
<td>9.7%</td>
<td>2%</td>
</tr>
<tr>
<td>STDs</td>
<td>3.6%</td>
<td>14.1%</td>
<td>1%</td>
</tr>
<tr>
<td>Damage to internal organs</td>
<td>9.4%</td>
<td>5.6%</td>
<td>4%</td>
</tr>
</tbody>
</table>
# Head Injuries

<table>
<thead>
<tr>
<th>Injuries</th>
<th>Index Trauma</th>
<th>Injuries from other assaults 1 - 3 times</th>
<th>Injuries from other assaults 4 - 50+ times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bruises: head, face, neck</td>
<td>34.7%</td>
<td>24.5%</td>
<td>32.7%</td>
</tr>
<tr>
<td>Broken bones: head, neck, face</td>
<td>3.8%</td>
<td>10.7%</td>
<td>2%</td>
</tr>
<tr>
<td>Cuts: head, neck, face</td>
<td>18.1%</td>
<td>15.7%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Lost consciousness</td>
<td>18.3%</td>
<td>20.8%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Damaged teeth</td>
<td>4.8%</td>
<td>10.4%</td>
<td>0%</td>
</tr>
<tr>
<td>Ruptured eardrum</td>
<td>2%</td>
<td>5%</td>
<td>0%</td>
</tr>
</tbody>
</table>
In summary…

- Participants across 3 clinical trials reported quite complex interpersonal trauma histories.

- The extent of the injuries (including head injuries) both during the index trauma and throughout their trauma histories was substantial and, in many cases, repetitive.

- Adding to the traumatic stress burden reported by our participants, the majority also described socioeconomic disadvantage:
  - lower levels of education
  - lack of employment
  - over half lived below the poverty line.
Question 4

Does the experience of head injury influence recovery from PTSD & depression over a course of CPT?
Across all three studies, 304 participants were randomized to one or more of the CPT study conditions (ITT sample for this study = 304)

- Study 1: Dismantling study\(^1\)
  - CPT v. CPT-C v WA

- Study 2: Variable Length of Treatment Study\(^2\)
  - Variable v Minimal Attn Control (included treated sample only)

- Study 3: Sleep Study\(^3\)
  - Monitoring plus CPT v Sleep-directed hypnosis plus CPT

\(^1\text{Resick et al., 2008; Galovski et al., 2012; Galovski et al., 2016}\)
In order to assess the influence of HI on treatment outcome, we grouped the sample into 3 comparison conditions:

**Head Injury (N = 224)**
- Bruises, broken or dislocated bones in head, neck, face; knocked unconscious, broken teeth, ruptured eardrums

**Non-head injury (N = 38)**
- Bruises, broken or dislocated bones in areas other than head, neck, face; ruptured internal organs, STDs, burnings, knifings, poisoning, gunshots, miscarriages

**No Injury (N = 42)**
Change in PTSD: (CAPS)

- Head Injury
- Non-Head Injury
- No Injury
Change in Depression: (BDI-II)

- Head Injury
- Non-Head Injury
- No Injury

Pre-Tx | Post-Tx | Follow-up
“Are you experiencing ongoing medical complications from your injury?”

We were able to identify 21 individuals who described ongoing medical problems/symptoms consistent with head injury. In their words…

- “continued pain, chronic jaw dislocation, hearing loss”
- “headaches & vision difficulties b/c being hit repeatedly in head”
- “headaches, hearing problems, eyesight left eye, dizziness, memory problem”
- “memory loss, incontinence, extremity numbness, had to learn to talk & walk & use hands again.”
- “thinking-head injuries, with teeth dentures, partials, left eye permanently damaged, torn ligament”
Compared to a group who denied head injuries...

BUT, reported other ongoing medical problems/symptoms reported:

- “blood clots in lungs”
- Multiple participants: “Pregnancies from assault, inability to conceive”
- “hip pops out of joint, lower back pain; lost ability to carry child full term”
- “nerve damage in left leg, right leg, right arm, removed part of pancreas and spleen, (pain in stitches)”
- “gastrointestinal sensitivity for whole life, inability to conceive”
- “permanent liver damage due to poisoning” -4 yrs escaped
- “burns got infected- can’t sit or lay down”
- “stomach pain/HPV/cervical cancer/ulcers/gallbladder removed”
Ongoing medical problems consistent with head injury vs no HI

<table>
<thead>
<tr>
<th></th>
<th>Ongoing HI Sxs (n = 21)</th>
<th>No HI (n = 84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time since index trauma</td>
<td>X = 8.8 years</td>
<td>X = 15.8</td>
</tr>
<tr>
<td>Gender</td>
<td>0 males</td>
<td>Includes 7 males</td>
</tr>
<tr>
<td>Dropped out of treatment</td>
<td>42%</td>
<td>30%</td>
</tr>
<tr>
<td>Index trauma</td>
<td>52% APA*</td>
<td>13% APA</td>
</tr>
<tr>
<td></td>
<td>5% CSA*</td>
<td>51% CSA</td>
</tr>
<tr>
<td></td>
<td>10% CPA</td>
<td>1% CPA</td>
</tr>
<tr>
<td></td>
<td>33% ASA</td>
<td>35% ASA</td>
</tr>
<tr>
<td>CSA</td>
<td>62%</td>
<td>73%</td>
</tr>
<tr>
<td>CPA</td>
<td>57%</td>
<td>41%</td>
</tr>
<tr>
<td>ASA</td>
<td>62%</td>
<td>61%</td>
</tr>
<tr>
<td>APA*</td>
<td>86%</td>
<td>54%</td>
</tr>
<tr>
<td>DV*</td>
<td>64%</td>
<td>35%</td>
</tr>
</tbody>
</table>
PTSD severity across assessment intervals (CAPS)

- Pre-tx
- post-tx*
- F-u*

- No HI
- Ongoing sxss
Individual symptoms of PTSD at Post-tx

* = p<.05; ** = P < .01. Trends for psychological distress and foreshortened future
Depression severity across assessment intervals (BDI-II)

- **Pre-tx**
  - No HI: Approximately 27
  - Ongoing sxs: Approximately 25
- **Post-tx**
  - No HI: Approximately 10
  - Ongoing sxs: Approximately 15
- **Follow-up**
  - No HI: Approximately 10
  - Ongoing sxs: Approximately 15
Individual Depression Symptoms at Post-Tx

- Anhedonia ($p = .022$) and Pessimism ($p = .052$) remained higher in the ongoing head injury group.

- Trends emerged indicating higher residual symptom severity following a course of treatment for:
  - Loss of pleasure ($p = .077$)
  - Suicidality ($p = .097$)
  - Changes in appetite ($p = .066$)
Refractory PTSD

Post treatment*  Follow-up*

- No head injury reported
- HI Symptoms
The Challenge: To which condition do we attribute the residual symptoms?

**DEPRESSION**
- Mood
- Anger
- Insomnia
- Concentration
- Suicidality
- Appetite
- Energy
- Worthless
- Anhedonia
- Psychomotor Agitation

**TBI**
- Headaches
- Impaired Memory
- Dizziness
- Vision
- Insomnia
- Concentration
- Anger
- Mood
- Anxiety

Intrusive Thoughts
- Nightmares
- Flashbacks
- Distress
- Physio
- Avoidance
- Foreshortened Future
- Numbing
- Detachment
- Amnesia
- Startle
- Cognition
- Anger
- Mood
- Concentration
- Insomnia
- Hypervigilance
Cincinnati VA
Comorbid TBI/PTSD\(^1\)

- Only published study to date looking at outcomes across severity of TBI with CPT
- OEF/OIF Veterans in residential care
- CPT plus cognitive rehab
- Significantly greater improvements in the Veterans with moderate to severe TBI.

Chard et al., 2011
Unpublished Study of Active Military

108 post-deployment soldiers with PTSD were randomly assigned to group CPT or Present-Centered Therapy (PCT) (Resick et al. 2015, JCCP).

Overall difference between CPT and PCT

No differences between CPT with or without TBI on PTSD, anger, depression.
The good news…

- Our head injured individuals showed significant improvements in PTSD and depression at rates of change similar to their non-head injured and non-injured counterparts.

- Therapy did not appear to be less palatable to the head injured participants, even those suffering from medical problems associated with the HI. There were no differences in completion rates.
However..

Our head-injured participants are reporting more severe symptoms at baseline and are significantly more likely to remain above clinical cutoffs for PTSD after a course of treatment.

The differences in outcomes may be due to several specific symptoms of PTSD. The question remains: are these symptoms better attributable to head injury than to PTSD and depression?
More questions than answers…

To what extent does brain injury influence recovery from PTSD?

What elements of the assault might be particularly important in prognosis?

- Force of blow(s)?
- Frequency of blows?
- Location of blow(s)?
- Time spent unconscious(s)?
- Time since assault(s)?
More Questions

lettes multiple blows, developmental age during assaults? Time between injuries? Sex differences?

How might we improve our ability to detect the effects of brain injury?

Will this knowledge lead us to more holistic interventions banking on multi-disciplinary strategies?

We now have modifications to CPT protocol that were not available when we conducted these studies.
In summary…

We need to assess for head injury and ongoing symptoms among those with family violence.

We need to adapt the CPT protocol as we have with military veterans to accommodate for special needs.

Should we be treating post-concussive symptoms along with PTSD?
Resources

- VA has a brief IPV screener (Iverson) HITS. Email me if you are interested in a copy.

- CPT is offered at Duke in the CBT clinic

- NIMH funded project at Duke (Watkins & Beckham) to study the effects of CPT on cardiac functioning.
To refer to the study

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919-668-6040
CPT vs. WL (who then can receive CPT)
For those with PTSD between 40-65
Paid for participation plus free therapy.