PTSD and Chronic Pain

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Objectives

• Recognize the link between PTSD and Chronic Pain
• Examine theoretical models explaining the co-occurrence of PTSD and chronic pain
• Appraise some treatment approaches
PTSD- Definition and Mechanisms
Posttraumatic Stress Disorder (PTSD)

• Experienced, witnessed, or confronted by threat of death or serious injury
• Response is intense fear, helplessness, or horror
• Persistent re-experiencing: intrusive recollections, distressing dreams, flashbacks, intense psychological or physiological distress at exposure to a cue reminiscent of the trauma
• Persistent avoidance: avoids thoughts, activities, feeling detached, restricted affect, sense of foreshortened future
• Persistent arousal: insomnia, irritability, poor concentration, hypervigilance, exaggerated startle

• Duration > 1 month
The Fear Structure

• A fear structure is a program for escaping danger
• It includes information about:
  • The feared stimuli
  • The fear response
  • The meaning of stimuli and responses
Trauma Memory

• A specific fear structure that contains representations of:
  • Stimuli present during and after the trauma
  • Physiological and behavioral responses that occurred during the trauma
  • Meanings associated with these stimuli and responses
  • Associations may be realistic or unrealistic
Characteristics of early trauma structure

- Large number of stimuli
- Excessive responses [PTSD symptoms]
- Erroneous associations between stimuli and “danger”
- Erroneous associations between responses and “incompetence”
- Fragmented and poorly organized relationships between representations
Early PTSD symptoms

• Trauma reminders in daily life activate trauma memory and the associated perception of “danger” and “self incompetence”
• Activation of the trauma memory is reflected in re-experiencing symptoms and arousal
• Re-experiencing and arousal lead to avoidance behavior
Recovery Process

• Recovery is the norm!!!

• Repeated activation of trauma memory and emotional engagement

• Incorporation of corrective information about “world” and “self”

• Activation and disconfirmation occur via confronting trauma reminders [thinking about, and contact with, trauma reminders]

• Corrective information consists of absence of anticipated harm
Chronic PTSD

- While avoidance may be helpful short term, over long term it is harmful.

- Persistent cognitive and behavioral avoidance prevents change in trauma memory by:
  - Limiting activation of trauma memory
  - Limiting exposure to corrective information
  - Limiting articulation of trauma memory and thus preventing organization of the memory
Erroneous cognitions underlying PTSD

• The world is extremely dangerous
• People are untrustworthy
• No place is safe
• I am extremely incompetent
• PTSD symptoms are a sign of weakness
• Other people would have prevented the trauma
PTSD and Chronic Pain - Epidemiology
Chronic Pain is Prevalent Among Individuals with PTSD

- 66-80% of combat vets with PTSD report chronic pain [Beckham et al., 1997; Shipherd et al., 2007]
- 45% of veteran firefighters with PTSD report chronic pain [McFarlane et al., 1994]
- 30-50% of MVA survivors with PTSD report chronic pain [Chibnall et al., 1994; Hickling et al., 1992]
- 22-49% of PTSD patients meet criteria for fibromyalgia [Amir et al., 1997; Amital et al., 2006]
Chronic Pain is Prevalent Among Individuals with PTSD

• Sareen et al. [2007]: Compared people with and without PTSD in a community sample of 36,984
  • PTSD: 46% chronic back pain
  • NO PTSD: 21% chronic back pain
  • PTSD: 33% migraines
  • NO PTSD: 10% migraines
  • Pain symptoms also more likely to persist in those with PTSD [Dirkzwager et al., 2007]
PTSD is prevalent among individuals with chronic pain

- Upto 33% of patients in pain clinics exhibit PTSD symptoms [Beckham et al., 1997; Benedict et al., 1996; MacFarlane et al., 1999; Meltzer-Brody et al., 2007]
- Rates of PTSD in patients with pain secondary to MVA are 30-50% [Hickling et al., 1992; Chibnall et al., 1994; Taylor et al., 1995]
PTSD is prevalent among individuals with chronic pain

- In a sample of 113 Veterans referred for pain treatment at VA Boston, 35% (n=50) met criteria for PTSD based on a PCL cutoff score of 50.

- In a sample of 30 OEF/OIF veterans referred for pain treatment at VA Boston, 73% (n=22) of the sample met criteria for PTSD based on a PCL cutoff score of 50.

PTSD + Chronic Pain = Worse Outcomes
PTSD + Chronic Pain = Worse Outcomes

- Chronicity of pain [Olsen et al., 2007; Dirkzwager et al., 2007]
- More intense pain [Geisser et al., 1996]
- More affective distress from pain [Geisser et al., 1996]
- Higher levels of life interference from pain [Turk et al., 1996]
- Lower pain threshold, and greater disability from pain [Sherman et al., 2000]
- Higher levels of depression and anger [Chibnall et al., 1994]
- PTSD related re-experiencing associated with pain severity, self-reported physical symptoms, and limitations in functional ability
Etiologic Models of co-occurring PTSD and Chronic Pain
Models unsupported by data

• One causes the other
• They are independent and unrelated to each other
Mutual maintenance

• Physiological, affective, and behavioral components of PTSD maintain and exacerbate pain AND vice versa

• Example:
  • Person with PTSD and musculoskeletal pain experiences pain and arousal
  • Pain and arousal are constant reminders of trauma that caused the pain
  • Trauma recollection leads to physiological arousal
  • This leads to avoidance of pain-related activities
  • This leads to deconditioning, which then worsens pain
  • Vicious cycle of distress and functional disability
Clinical Examples

• “When ever I'm laying in bed at night and my shoulder starts hurting, I start having thoughts of when I was shot.”

• “When I think about the day my car had the accident, I can feel the pain in my back flare up right where I was hurt.”

• “I tried my PT exercises but the pain started increasing and I started thinking about what I saw and heard in Iraq so I just said the heck with it and called it quits for the day.”

• “I managed to avoid dealing with my PTSD all of my life, but when the other car hit me it brought all of the feelings to the surface (feeling powerless).
Shared vulnerability

• Mutual maintenance factors may be related to some shared vulnerability
• Combination of genetics and environmental factors
PTSD and pain

- AVOIDANCE is critical to maintaining PTSD
- It may also worsen pain outcomes
- Often, the same event that led to chronic pain also led to the PTSD
- Pain related avoidance may worsen PTSD
Psychological mechanisms underlying pain-PTSD relationship
Anxiety sensitivity [AS]

• Fear of anxiety based on belief that anxiety may have harmful consequences
• Increased in most anxiety disorders
• May also be increased in some chronic pain conditions [Asmundson et al, 2000]
• AS correlated with PTSD severity
• AS correlated with severity of labor and dental pain
• AS increases the risk of pain-related avoidance and disability following physical injury in adults and children with chronic pain
• Influenced by genetic and environmental factors
• Catastrophizing – exaggerated beliefs and expectations that events will lead to negative outcomes.
Selective attention to threat

• Directing attention to feared objects or situations
• Robust findings for many anxiety disorders
• Less robust findings for chronic pain
• Patients with greater pain severity and pain-related disability more likely to selectively pay attention to trauma related stimuli than those with less pain [Beck et al., 2001]
Lower threshold for alarm

• Pain and anxiety both lead to physiologic arousal
• Prolonged states of arousal can be detrimental to health
• Anxiety disorders, particularly PTSD, see increased sympathetic activity
• This can lead to further avoidance
Avoidance!

- PAIN: The avoidance of physical activities
- PTSD: The avoidance of feared thoughts/situations
Treatment Approaches
Psychosocial treatments
Posttraumatic Stress Disorder (PTSD)

Non-Medication Treatment

- Exposure Therapy [evidence: Ia]
- CBT/Cognitive Restructuring [evidence: Ia]
- EMDR [evidence: Ia]
- Seeking Safety

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Tyrer & Silk, Effective Treatments In Psychiatry, 2008, Cambridge University Press
Non-pharmacological approaches

- Woods & Asmundson [2008]: Graded in-vivo exposure demonstrated significant improvements in:
  - fear of pain and movement
  - fear-avoidance beliefs
  - pain-related anxiety
  - pain self-efficacy
  - Anxiety and depression
  - Pain catastrophizing
  - [compared to wait list and graded activity]
  - Only 8 sessions; improvements maintained over 1 month f/u
Need for integrated treatment

• **Parallel Treatment**
  • Poor collaboration among providers
  • Different philosophies of treatment
  • Patient receives no treatment because no one takes responsibility

• **Sequential Treatment**
  • Untreated disorder worsens the treated disorder
  • Disagreement as to which should be treated first
  • Clinicians don’t follow through with referral for the untreated disorder
Need for integrated treatment

• Liedl and Knaevelsrud [2008]
  • Psychoeducation
  • Physical activation to break the cycle of avoidance
  • Relaxation techniques to reduce hyperarousal [progressive muscle relaxation, diaphragmatic breathing, biofeedback]
Integrated treatment model
[Otis and Keane]
<table>
<thead>
<tr>
<th>CBT for Pain</th>
<th>CBT for PTSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education re: pain</td>
<td>Education re: PTSD</td>
</tr>
<tr>
<td>Relaxation training</td>
<td>Cognitive restructuring vs Prolonged Exposure therapy</td>
</tr>
<tr>
<td>Cognitive restructuring</td>
<td>Teach coping skills</td>
</tr>
<tr>
<td>Stress management</td>
<td>Social support</td>
</tr>
<tr>
<td>Activity pacing</td>
<td>Anger management &amp; sleep</td>
</tr>
<tr>
<td>Pleasant activity scheduling</td>
<td>Reprocessing the meaning of the event</td>
</tr>
<tr>
<td>Anger management</td>
<td></td>
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<tr>
<td>Sleep hygiene</td>
<td></td>
</tr>
<tr>
<td>Relapse prevention</td>
<td></td>
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</tbody>
</table>
Integrated Treatment

• **Session 1**  Education on Chronic Pain and PTSD
• **Session 2**  Making Meaning of Pain and PTSD
• **Session 3**  Thoughts/Feelings related to Pain and PTSD & Cognitive Errors
• **Session 4**  Cognitive Restructuring
• **Session 5**  Diaphragmatic Breathing and Progressive Muscle Relaxation
• **Session 6**  Avoidance and Interoceptive Exposure
• **Session 7**  Pacing and Pleasant Activities
• **Session 8**  Sleep Hygiene
• **Session 9**  Safety/Trust
• **Session 10**  Power/Control/Anger
• **Session 11**  Esteem/Intimacy
• **Session 12**  Relapse Prevention and Flare-up Planning
Posttraumatic Stress Disorder (PTSD)

Medication Treatment

- Prazosin [evidence: Ib]
- SSRIs [evidence: Ia]
- SNRIs [evidence: Ib]
- Antipsychotics [evidence: Ib] works best for those that do not respond to SSRI/SNRI
- Bupropion, Trazodone [evidence: IIa]
- Mirtazepine [evidence: IIb]

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Tyrer & Silk, Effective Treatments In Psychiatry, 2008, Cambridge University Press
<table>
<thead>
<tr>
<th>Medication</th>
<th>Anxiolytic Efficacy*</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoxetine</td>
<td>Panic, † PTSD*</td>
<td>Generic available; long half life (no withdrawal)</td>
<td>Most stimulating; longer half life</td>
</tr>
<tr>
<td>Paroxetine</td>
<td>Panic, † GAD, † SAD, † PTSD †</td>
<td>Generic available; most extensively studied across these anxiety disorders; least stimulating; no P450 3A4 effects</td>
<td>Most sedating; shorter half life and worse withdrawal</td>
</tr>
<tr>
<td>Sertraline</td>
<td>Panic, † GAD, * SAD, † PTSD †</td>
<td>Well-studied across these 4 anxiety disorders; least P4502D6 effects; minimal P4503A4 effects; intermediate half life (less withdrawal)</td>
<td>Most diarrhea</td>
</tr>
<tr>
<td>Citalopram</td>
<td>Panic*</td>
<td>Generic available; no P450 effects</td>
<td></td>
</tr>
<tr>
<td>Escitalopram</td>
<td>Panic, * GAD, † SAD*</td>
<td>No P450 effects</td>
<td></td>
</tr>
<tr>
<td>Venlafaxine ER</td>
<td>Panic, † GAD, † SAD, † PTSD</td>
<td>No P450 effects, pain effects</td>
<td>Short half life; withdrawal with missed dose or sudden discontinuation; increased blood pressure at &gt;225 mg</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>GAD†</td>
<td>Pain effects</td>
<td>Unclear efficacy for other anxiety disorders; more stimulating</td>
</tr>
</tbody>
</table>

*Randomized controlled trials but no Food and Drug Administration-approved indication.
†Food and Drug Administration-approved indication as of January 2006.
GAD, generalized anxiety disorder; PTSD, posttraumatic stress disorder; SAD, social anxiety disorder.
Basic Steps to pharmacotherapy

• Step 1: Try an SNRI or an SSRI
• Step 2: Augment with anti-anxiety medications [non-benzodiazepines first, then benzodiazepines]
  • Early in tx for faster response/”bridge”
  • Later for breakthrough anxiety
  • Consider use of gabapentin, pregabalin
• Step 3: Switch SSRI/SNRI or anti-anxiety medications
• Step 4: Continued lack of response: Consult with a specialist
Conclusions

• Chronic pain and PTSD co-occur at higher than expected rates
• Co-occurrence related to worse outcomes
• There may be mutually maintaining underlying mechanisms
• These mechanisms can often be addressed through non-pharmacologic means
• Medications can also play an important role in treatment