Psychological Effects: A Common Co-morbidity in Concussion

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What is a concussion?

- Mild traumatic brain injury (mTBI)
- A disruption in normal brain function due to a blow or jolt to the head
- CT or MRI is almost always normal
- Invisible injury
THE CONSEQUENCES OF CONCUSSION/mTBI

- Can result in adverse symptoms
  - Physical
  - Behavioral/emotional
  - Cognitive
    ➔ Can impact an individual’s activities of daily living and participation in life roles.
- Early diagnosis and management of Concussion/mTBI will improve a patient’s outcome and reduce the impact of persistent symptoms
Many patients with mTBI report concussive symptoms that resolve within weeks to months

**Cognitive**
- Memory problems, cognitive deficits
- Poor concentration and attention
- Slower processing

**Somatic**
- Headache, nausea, dizziness, vision changes

**Emotional**
- Depression, anxiety, irritability
- Change in motivation; poor tolerance of activities

*Cnossen, M.C et al, 2018*
Large subset of patients may experience these symptoms for six months to one year or even longer post injury.

Literature shows strong correlation with:
- Female sex
- History of mental health diagnosis
- Type of injury – MVA; assault
- Experiencing high PCS – 2 weeks post injury
- Diagnosis of other orthopedic injuries

*Cnossen, M.C et al, 2018*
HOW THE BRAIN RESPONDS TO A THREAT

- Amygdala – the alarm sounds and activates the emotional memory center
- Limbic system – (a set of structures in the brain that deal with emotions and memory) perceives and reacts to the threat
- Frontal Cortex – Shuts down to facilitate instinctive responding

Activation of the Stress Response

Bremner et al., 2008; Fisher, 2017
THE STRESS RESPONSE

Cortisol release triggers Parasympathetic System

**Activation of the Sympathetic Nervous System:** noradrenaline release, increased heart rate and respiration, rush of energy to muscle tissue, suppression of non essential systems, frontal lobe inhibition

**Activation of the Parasympathetic Nervous System:** decrease autonomic activation, shaking and trembling, exhaustion, depletion, shutting down, numbing

Bremner et al., 2008; Fisher, 2017
DIAGNOSTIC APPROACH

- Use of standardized measures
  - Concussion
    - The Rivermead Post-Concussion Symptoms Questionnaire – (RPQ)
  - Anxiety & Depression
    - Hospital Anxiety and Depression Scale (HADS)
  - PTSD
    - Impact of Events Scale – Revised (IES-R)
  - Cognitive screen
    - Mini Mental State Examination or Montreal Cognitive Assessment (MOCA)
TAKING A GOOD HISTORY

- Nature of injury
  - Accident, MVA, Fall
  - No-fault/Workman’s compensation

- Type of injuries
  - Neck, other orthopedic injuries
  - Emotional changes

- Medical history/psychiatric history

- Symptom presentation
  - Heightened reporting of symptoms can lead to persistent PCS

- Style of coping prior to the injury
  - Active vs. passive

- Length of time since injury
## Symptom Presentation of Concussion Patients

### Typical
- Headache
- Dizziness
- Vision changes
- Light & noise sensitivity
- Cognitive processing changes
- Fatigue/ sleep changes
- Irritability – over injury
- Decrease in social engagement

### Atypical
- **Headache** – intensity is severe & limits majority of functioning
- **Vision changes** – avoiding any visual stimulation/ wears sunglasses all of the time
- **Sensory sensitivity** – unable to tolerate light, noise and avoiding situations
- **Sleep changes** – sleeping more than 12 hours per day and napping (indicative for depressive symptoms) or unable to sleep; nightmares & ruminating thoughts
- **Anxiety symptoms** – either exacerbated or new since injury; fears related to social engagement; talking or thinking about injury
- **Speech difficulty** – stuttering
- **Loss of body function** - unexplained
MULTIDISCIPLINARY TREATMENT APPROACH OF TYPICAL SYMPTOMS

- Medical management (MDs, Dos, NPs, PAs) — medical assessment, medication management
- Rehabilitation Psychology — (Psychologists) — provide CBT interventions post injury; normalize the reaction
- Neuropsychology (Neuropsychologists) — provide cognitive testing to assess deficits post injury
- Physical Therapy (PT) — exertion, dizziness, headache, neck symptoms
- Occupational Therapy (OT) — assess cognitive and vision struggles
- Speech Therapy (SLP) — Cognitive retraining
- Referral to:
  - Optometry, Neurology, Orthopedics,
  - Pain Management, ENT, Pulmonology

Leddy et al, 2012
TREATMENT ACCOMMODATIONS FOR PATIENTS with:

- **ATYPICAL SYMPTOMS**
  - They will have a smaller window of tolerance
  - May need to prioritize treatment based on symptom intensity & presentation
    1. Medical – medications for headaches & emotional symptoms
    2. Psychology – education; create a plan for gradual return to baseline functioning; consider formal counseling
    3. PT – getting the patient up; movement (can help both physical and emotional symptoms)
    4. Vision assessment & OT – identify visual struggles; distinguish between premorbid symptoms versus changes form the injury
    5. Consider referral to other specialty services
REFERENCES


