Psychology, Concussion, and Post-Concussion Syndrome - Horses and Zebras

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What does psychology have to do with concussions?

Maybe a better question. What does psychology have to do with adolescents?

25%  13%  16-75%
Some Terms

• Post concussion syndrome
• Complicated vs. uncomplicated concussion
• Placebo effect
• Iatrogenesis
• Empirical (or research) evidence

Long-Term Consequences?

Hierarchy of Scientific Evidence

- Strongest
- Meta-analyses & systematic reviews
- Randomized controlled trials
- Cohort studies
- Case-control studies
- Cross sectional studies
- Animal trials & in vitro studies
- Case reports, opinion papers, and letters
Post hoc, ergo propter hoc

After this, therefore because of this

Post concussion Syndrome (PCS)
Do we all have PCS?

- Headaches
- Dizziness
- Fatigue
- Irritability
- Anxiety
- Insomnia
- Poor concentration
- Memory problems
- Noise sensitivity
- Light sensitivity

“Healthy” students certainly have PCS

<table>
<thead>
<tr>
<th></th>
<th>Healthy teens at baseline</th>
<th>Healthy college students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>13%</td>
<td>36%</td>
</tr>
<tr>
<td>Difficulty remembering</td>
<td>23%</td>
<td>46%</td>
</tr>
<tr>
<td>Anxious/Nervous/Irritable</td>
<td>22%</td>
<td>42%</td>
</tr>
<tr>
<td>Feeling slowed down</td>
<td>14%</td>
<td>60%</td>
</tr>
<tr>
<td>Difficulty concentrating</td>
<td>17%</td>
<td>59%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>22%</td>
<td>77%</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>16%</td>
<td>50%</td>
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</tbody>
</table>
7.8 million high school athletes

Concussions = 9-13%

"PCS" = <5%

Concussion related "PCS" = 10-15%

Injury Factors
- Initial injury severity
- Imaging findings
- Multiple injuries?
- Development of post-injury
  - Headache/migraine
  - Migraines
  - Depression

Non-Injury factors
- Pre-injury symptoms
- Pre-injury
- LD/Bx problems
- Psych conditions
- Headache/migraine
- Faking/Maladaptive Coping
- Perception Bias
- Expectation Bias
- Overmanagement/Mismanagement
“When you hear hoof beats, look for horses, not zebras”

What are the horses and the zebras?
Data from Children’s Hospital Colorado Concussion Team
How to manage the horses

• Good injury education
• Reassurance of recovery and good clinical management
• Brief CBT for remaining symptoms
• Active rehab
• Return to life as normal
• Neuropsych support

What are mental health warning signs?

• Often feels anxious or worried
• Has very frequent tantrums or is intensely irritable much of the time
• Has frequent stomachaches or headaches with no physical explanation
• Is in constant motion, can’t sit quietly for any length of time
• Has trouble sleeping, including frequent nightmares
• Loses interest in things he or she used to enjoy
• Avoids spending time with friends
• Has trouble doing well in school, or grades decline
• Fears gaining weight; exercises, diets obsessively
• Has low or no energy
• Has spells of intense, inexhaustible activity
• Harms herself/himself, such as cutting or burning her/his skin
• Engages in risky, destructive behavior
• Harms self or others
• Smokes, drinks, or uses drugs
• Has thoughts of suicide
• Thinks his or her mind is controlled or out of control, hears voices
Effects of Insufficient Sleep

- Poor judgement
- Lack of motivation
- Inattention
- Affective dysregulation

Higher level cognitive and executive functions

Increased risk of suicide attempts

Risk of developing depression/anxiety and of relapse

1-800-273-TALK (8255)
The National Suicide Prevention Lifeline
When is specialized treatment best?