Evidence Mounts Linking Head Hits To Permanent Brain Injury - December 03, 2012

Concussions May Be More Severe in Girls and Young Athletes ... – May 10th, 2012

Concussions may cause lingering mental anguish – May 14th, 2014

Did multiple concussions lead to OSU football player’s suicide? – 12/1/2014
Post Concussive Symptoms

- **Cognitive Symptoms**
  - “Fogginess”
  - Difficulty concentrating
  - Memory deficits
  - Cognitive Fatigue

- **Sleep Alterations**
  - Difficulty falling asleep
  - Fragmented sleep
  - Too much/too little sleep

- **Somatic Symptoms**
  - Headaches (up to 78%)
  - Dizziness (up to 50%)
  - Visual changes
  - Light/Sound Sensitivity

- **Mood Disruption**
  - Irritability
  - Feeling sad
  - Anxiety
Post Concussive Syndrome


Defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) – *Major or mild neurocognitive disorder due to traumatic brain injury.*
Neuropsychiatric Complications

- Cognitive Deficits (25-70%)
- Depression (25-50%)
- Anxiety disorders (10-77%)
- Agitation & Aggression (~30%)
- Sleep problems (30-70%)
- Suicide (3x Incidence)
- Substance use disorders
- Psychosis
- Obsessive compulsive disorder
- Personality changes
- Alzheimer’s disease
- ADHD
- Mania (1-10%)
- Stress Disorders
- Apathy (10%)
Neuropsychiatric Complications

- Mild TBI at 12 months follow up 22% developed a psychiatric disorder that they had never experienced before
- ~40% of TBI victims with a disorder have 2 or more psychiatric disorders
- With no past psychiatric history the adjusted relative risk is increased compared to no TBI
  - **Mild TBI ARR = 2.8**
- Past psychiatric history is a significant predictor of psychiatric illness

Brant, RA et al., 2010, Vaishnavi et al., 2009 and Jorge, RE. 2005
OUTSIDE the LINES

OUTSIDE
the LINES
SUNDAY
Signs and Symptoms

- Symptoms don’t match exam
- Struggles returning to baseline
- Changes in personality
- Low motivation
- Drop in grades
- Hopelessness
- Avoidance
- Isolation
- Crying
Case Example

- 15 year old male freshman in high school
- Re-injury with bumpy car ride after being symptom free
- Significant struggles at school and at home
- Fear of another re-injury

- 14 year old female 8th grader
- Soccer injury with intense desire to return to sport
- Headaches won’t resolve despite multiple treatments
- Not participating in eye exercises at home
Case Example

- 18 year old senior in high school, skiing accident
- After period of rest “unable” to return to school
- Prescribed physical therapy did some
- Prescribed medication took one, but as prescribed
- Continued head pain after exertion and fatigue

- 19 year old college sophomore, rugby injury
- Struggles with boyfriend
- Partying on most nights
- Failing out of school
Treatment

- Education, Support and Guidance
- Rest (brain and body)
- Accommodations
- Sleep hygiene
- Relaxation
- Psychotherapy
- Medications
- Vestibular therapy
- Physical therapy
- Cognitive Rehabilitation
- Vision Therapy
Education, Support & Guidance

- 12 studies have been done
- Mixed results with regard to improvement in symptoms and functioning
- Overall support and education appear to benefit patients
- Reassurance and education may be helpful shortly after injury
- Group education and support intervention and group CBT decreased postconcussive symptoms compared to wait list

Comper DP. et al., 2005 and Snell DL et al., 2009
Accommodations

Academic- 504 plan in school can include:

• Shortened day
• Adjusted class schedule
• Breaks
• Seating changes
• Extra time
• School counseling

• Progress reports
• Quiet areas
• Excused activities
• Academic support
• Etc...
Sleep hygiene

- Only go to bed when tired
- Don’t lie in bed more than 20 minutes
- Relax each night before bed
- Wake up at the same time every morning
- Avoid taking naps
- Avoid any caffeine after lunch
- Etc...
Relaxation

- Deep breathing
- Progressive muscle relaxation
- Calming visualization
- Meditation
- Etc.
Therapy

- **Cognitive Behavioral Therapy**
- **Bryant, RA. et al., 2003**
  - 24 patients
    - A trauma within 2 weeks
    - Acute stress disorder
    - Mild traumatic brain injury
  - CBT vs. Supportive Therapy for 16 sessions
  - At 6 months CBT was superior 8% v. 58% meeting criteria for PTSD
Cognitive Behavioral Therapy

What we *think* affects how we act and feel.

What we *feel* affects what we think and do.

What we *do* affects how we think and feel.

Family and Family Therapy

• “Group differences in somatic symptoms as reported by parents were more pronounced among children from families that were higher functioning and had more environmental resources.” (Yeates, K. et al., 2012)

• “Mild TBI are associated with family burden and distress more than mild injuries not involving the head, although PCS may influence post injury family burden and distress more than the injury per se.” (Ganesalingam, K. et al., 2008)
Medications

• No medication has FDA approval for the treatment of neuropsychiatric consequences of TBI

• Limited quality research mostly on adults

• Many different medications have been used

Arciniegas DB, et al., 2008
Cognitive Deficits

- **Methylphenidate (Ritalin/Concerta)** increases attention and processing speed
  - First line for attention difficulties
  - Side effect: headache, loss of appetite, sleep problems
- **Amantadine (Symmetrel)** improving cognition
  - Side effects: headache, depression, anxiety, dizzy
- **Donepezil (Aricept)** increases attention and memory
  - First line for memory problems
  - Side effects: headache, insomnia, nausea

Depression

- **SSRIs – Sertraline (Zoloft), Fluoxetine (Prozac), Escitalopram (Lexapro)**
  - Side effects: nausea, headache, insomnia, suicidal thinking
- **SNRIs – Venlafaxine (Effexor), Duloxetine (Cymbalta)**
  - Limited data at this time
- **Bupropion (Wellbutrin)**
  - Caution due to increased seizure risk
- **Tricyclic antidepressants (TCAs) – Amitriptyline (Elavil), Nortriptyline**
  - Often used for headaches in low does. Generally for depression should be avoided in those with cognitive dysfunction due to anticholinergic effects
- **Methylphenidate (Ritalin) improved mood**
  - Lee (2005) and Gualtieri (1998)
Disordered Sleep

• **Melatonin** – Over the counter
  – Helps with initiating sleep

• **Trazodone**
  – Helps with initiating sleep and maintaining sleep
  – Side effects: Dizzy, drowsiness, headaches

• **Mirtazapine (Remeron)**
  – Helps with depression and sleep
  – Side effects: weight gain, dry mouth, sedation

• **Avoid** anticholinergic meds (**Benadryl**, **ZzzQuil**, etc...)

Vaishnavi et al., 2009
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