Psychopharmacological Management of ABI

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Agenda

- Define and discuss ABI in brief
- Enumerate Psychopathy's
- … and then discuss Management with medications

As otherwise, there is no context within which psychopharmacology makes sense!
ABI is ...

- **Dynamic**
- **Multidimensional**
  - Focal injury
  - Diffuse axonal injury
  - Diffuse microvascular injury with loss of autoregulation
  - Selective neuronal excitotoxic loss
  - Superimposed classical hypoxic-ischemic injury
Coup Contrecoup Injuries
Psychiatric Sequelae of ABI

- Post-Traumatic Delirium
- Post-Concussive Syndrome
- Maladaptive Coping
- Cognitive Difficulties
- Affective Disorders
- Anxiety Disorders
- Psychotic Disorders
- Sleep Disorders
- Personality Disorders
- Behavioral Sequelae especially Aggression and Apathy
- Effects on the family

Thus, effective management has to address most of these factors at varying times.
Common Issues ...
Depression

- in Left dorso-lateral frontal and left basal ganglia damage
- Can be acute post-ABI (soon after) or late-onset (months to years)
- Acute
  - Neurophysiological or neurochemical
  - vegetative symptoms
- Late-onset
  - Psycho-social and awareness
  - psychological and somatic symptoms
Anxiety Disorders

- Associated with right hemisphere lesions
- Generalized Anxiety Disorder, the most common diagnosis
- Paradoxically, incidence in patients with mild-ABI
Bipolar Affective Disorder

- Increased in right hemisphere lesions especially affecting baso-temporal cortex or limbic system
- Associated with increased prevalence of post-ABI epilepsy
- Often associated with increased anxiety, especially with right hemisphere lesions
- Males > Females
- Increased in patients with moderate to severe ABI
Personality Disorders

- **Diagnosis of:**
  - borderline personality disorder
  - avoidant personality disorder

- **Certain personality types are typical:**
  - pseudodepressed
    - in lesions of the dorsomedial aspects of the frontal lobes
  - Pseudopsychopathic
    - in lesions of the orbital aspects of the frontal lobes

- in patients with premorbid maladaptive personality
Psychotic Disorders

- Usually present with fragmented delusions
- Usually paranoid
- ↑ in the early post-ABI period
- In the early post-ABI period, ↑ in patients with diffuse cerebral swelling and mid-line shifts
Attention Disorders

- Also called Secondary ADHD (SADHD) post TBI
- Described in Children. No research available in adults
- Incidence varies between 16-20%\(^1\)
  - Mainly inattentive. Rarely hyperactive
- Pre-injury risk factors poorly understood
- No definite relationship of SADHD to injury severity
  - In fact, mild TBI may lead to increased risk
- Lesions of the Putamen, basal ganglia, thalamus, orbito-frontal cortex and pre-frontal cortex possibly associated with increased risk of SADHD
- Co-morbid with Personality Change due to TBI, ODD, CD, Disruptive Behavior Disorder
- Not associated with new onset Depressive or Anxiety Disorder

Is ADHD a Factor?

- SADHD may occur in 16-20% of patients
- However, inattentiveness and attentional disorders occur in a vastly greater % of patients. Possibly due to:
  - The apathy and anhedonia of the ABI itself
  - Neuropsychiatric syndromes causing or exacerbating attention disorders:
    - Personality Change, Depression, Anxiety, Psychotic Disorder
    - Substance Use / Abuse
    - Pain syndromes and its management
    - Sleep Disorders
  - Iatrogenic Syndromes

Sleep Disorders

- 46% of Traumatic Brain Injury patients have sleep disorders
  - 23% Obstructive Sleep Apnea
  - 11% Post-Traumatic Hypersomnia
  - 6% Narcolepsy
  - 7% Periodic Leg Movements in Sleep
- 25% Excessive Daytime Sleepiness
- Sleepy subjects had a greater body mass index (BMI) than those who were not sleepy ($p = 0.01$)
- OSA was more common in obese subjects ($BMI \geq 30, p < 0.001$)

Seyone and Kara, Head Injuries and Sleep, Sleep and Sleep Disorders, Landes Biosciences, 2006
Comparisons of sleep-disordered versus non-sleep-disordered subjects disclosed no relationship between the presence of a sleep disorder and injury severity, cause of injury, or the presence of positive CT scan findings.

Consider other psychiatric diagnoses that may contribute to sleep problems (e.g. depression, anxiety, psychosis).

Consider Iatrogenic Sleep disorders (e.g. medications).

Timing of sleep disturbances in ABI patients:
- 72.7% of a cohort of 22 inpatients with ABI manifested sleep disorders 3-5 months post injury while another 51.9% of 77 patients had sleep complaints even after 29.5 months since the injury (Cohen et al., 1992).

A distinction was present in that early post injury patients had difficulty initiating and maintaining sleep, while late post injury patients had a preponderance of excessive somnolence during the day.

Castriotta et al, 2007
Aggression

- Immediately post-ABI (35-96%)
- <2 wks. to 4-6 wks.
  - ? = Posttraumatic amnesia plus excess of behavior such as aggression, disinhibition, and/or emotional lability
  - ? = Post-traumatic delirium
- As a longer term sequela (severe TBI – 31-71%; mild TBI – 5-70%)
  - After the acute recovery phase
  - Days, weeks, months, years later
Neuropathology

- Hypothalamus
  - Orchestrates neuroendocrine response via sympathetic arousal
  - Monitors internal status
- Limbic System
  - Amygdala
    - Activates and/or suppresses hypothalamus
    - Inputs from neocortex
- Temporal Cortex
  - Associated with aggression in both ictal and interictal states
- Frontal Neocortex
  - Modulates limbic and hypothalamic activity
  - Associated with social and judgment aspects of aggression
NEUROCHEMISTRY

- Norepineprine
- Serotonin
- Dopamine
- Acetylcholine
Features of Aggression in ABI

- Reactive
  - Triggered by modest or trivial stimuli

- Nonreflective
  - Usually does not involve premeditation or planning

- Nonpurposeful
  - Serves no obvious long-term aims or goals

- Explosive
  - Buildup is not gradual

- Periodic
  - Brief outbursts of rage and aggression punctuated by periods of relative calm
Behavioural Syndromes
Orbitofrontal Syndrome

“Behavioural excess”
- Impulsivity
- Hyperactivity
- Lability
- Psychomotor hyperactivity
- Aggression

Impulsive / Aggressive

September 12th, 2013
Dorsolateral Frontal Syndrome

“Slow” syndrome
- Inattentive
- Poor judgment
- Perseveration
- Psychomotor retardation
- Passivity
- Blunt affect
- Disorganized
- Rigid
- Concrete

dysexecutive
Apathy

- Poor initiation
- Poor follow through
Psychopharmacological Management by itself is generally futile. It needs to be part of a:

- Team Approach
- Patient is at the center of coordinated care
- Individualized

Why?
Without a proper understanding of the patient and family / environmental dynamics, the chances of successful treatment are slim. Therefore, do a:

- Thorough case review
  - Medical, educational, social

- Assess current and past level of functioning
  - competency-treatment and financial
  - daily living skills
  - cognitive ability
  - social skills
  - behavioral issues
  - family and social relationships
  - recreational activities
  - employment interests and abilities
Follow up Management - To deal with:

- **Aggression and agitation**
  - teach alternative acceptable behavior, develop contingencies, medications

- **Disinhibition and sexual inappropriateness**
  - develop acceptable outlets, recreational workshops

- **Passivity**
  - address fatigue, if any, reinforce social groups and activities, medications

- **Attentional disorders**
  - instructions, reinforcements and prompts, medications

- **Memory deficits**
  - spaced-retrieval technique, daily planners

- **Psychiatric syndromes of depression, psychosis, anxiety**
  - medications

- **Poor patient-family interaction**
  - encourage social skills training, family therapy

- **Finances**
  - obtain financial assistance from appropriate sources

- **Housing**
  - help patient get and keep accommodation
**Medications**

- **Antidepressants**
  - SSRI, SNRI, RIMA, TCS, MAOI
- **Anxiolytics**
  - Benzodiazepines, Buspirone
- **Neuroleptics**
  - High Potency, Low Potency, Mid Potency, Atypical, New
- **Sedative Hypnotics**
  - Benzodiazepines, Zopiclone
- **Anticonvulsants**
- **Stimulants**
  - Methylphenidate, Atomoxetine,
Common Side Effects of Medications

Dependent on:
- Group of Medication
- Dose of Medication
- Route of Administration
- Patient Profile
- Drug Interaction
- Unknown factors…
  * idiosyncratic reactions
Main Side Effects to be concerned about:

- **Neuroleptics:**
  - Acute Dystonic Reaction
  - Akathesia
  - Extra Pyramidal Symptoms (EPS)
  - Tardive Dyskinesia

- **Others:**
  - GI upset
  - Insomnia / Hypersomnia
  - Postural Instability and Falls
  - Incontinence
  - Sexual Dysfunction …

- **Stimulants:**
  - Akathisia
  - Irritability and Aggression
  - ? Potential for abuse
Psychopharmacology of Aggression

- Acute Aggression
  - Antipsychotics
    - Especially atypical - Risperidone (up to 6 mg/day), Olanzapine (unto 20 mg/day)
    - Side effects
      - Over-sedation, weight gain, drooling, decreased seizure threshold …
  - Benzodiazepines
    - Especially Clonazepam (unto 2-3 mg/day)
    - Side effects
      - Over-sedation, cognitive deterioration (memory), postural instability, disturbed coordination, paradoxical rage or disinhibition …
- Chronic Aggression
  - Anticonvulsants
    - Especially Carbamazepine, Valproic Acid (Dose as per blood levels)
    - Side effects - Bone marrow suppression, hepatotoxicity
  - Lithium - (Dose as per blood levels)
    - Side effects - Neurotoxicity, confusion
  - Buspirone
    - Side effects - Delayed onset of action
  - Beta blockers
    - Propranolol, Atenolol
    - Side effects - Latency of 4-6 weeks
  - Antidepressants
    - Newer medications preferred – Zoloft, Effexor, Wellbutrin
    - Side effects – Headache, Sweating, GIT upset
  - Anxiolytics
    - Benzodiazepines – Clonazepam
  - Antipsychotics
    - Newer medication preferred – Risperidone, Olanzapine
Case Presentation

- Shane P.
- Male / 45 years old (DOB: 16/05/1968)
- Former black belt in Karate
- MVA > 20 years ago
- ABI – Severe
- Aphasic – Receptive and Expressive
- Cannot communicate needs / wants
- Diabetic – Brittle
- Severe Behavioral issues – Aggression especially during care routines
- Incontinent – both urinary and fecal
- Highly tolerant and resistant to medications
- Behavioral programs very difficult if not impossible
- Currently in a locked community institution
- Was in a locked, padded room in hospital for a number of years
- Now has a much improved quality of life – able to go accompanied outside in the community
Shanès Current Medications
<table>
<thead>
<tr>
<th>ALLERGIES: Azithromycin, Lactose</th>
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<tbody>
<tr>
<td><strong>MEDICATION</strong></td>
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<td>APO-CARBAMAZAPINE</td>
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<td>SODIUM CHLORIDE</td>
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<td>METAMUCIL (Mucillium)</td>
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<td>MEDICATION</td>
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<tr>
<td>GLUCAGON INJECTION</td>
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<td>DEXTROSOl (Or 1 tbsp of honey)</td>
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<td>DIAZEPAM 5 mg</td>
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<td>APO-LORAZEPAM</td>
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<td>APO-ACETAMINOPHEN 500 MG=1 TABLET</td>
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<td>LACTULOSE</td>
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<td>TYLENOL (ACETOMINAPHEN)</td>
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<td>FUCIDIN OINTMENT</td>
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<td>SYSTANE BALANCE EYE DROPS</td>
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Shane P. Daily Average of Negative Target Behaviours by Medication Condition

- Average of PRN - Agitation
- Average of AG-1
- Average of AG-2
- Average of Physical Aggression

Behaviour Rates

Easy, isn’t it?
One other thing!
<table>
<thead>
<tr>
<th>Physical Signs of Stress</th>
<th>Emotional Signs of Stress</th>
<th>Mental Signs of Stress</th>
<th>Behavioural Signs of Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches, migraine, stomach aches</td>
<td>Anxiety and being bad-tempered</td>
<td>Poor concentration</td>
<td>Acting in a defensive, aggressive or impulsive manner</td>
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<tr>
<td>Muscle tension</td>
<td>Excessive worrying, moody</td>
<td>Forgetfulness</td>
<td>Nervous habits (e.g. stammering or biting nails)</td>
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<td>Stomach ulcers</td>
<td>Sadness, fear</td>
<td>Lack of confidence</td>
<td>Loss of interest in activities</td>
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<td>Faster heartbeat</td>
<td>Feeling inadequate</td>
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<td>Avoidance of tasks</td>
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<td>Sleep disruption</td>
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<td>Easily distracted</td>
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<td>Loss of appetite or overeating</td>
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<td>Withdrawing from social activities</td>
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<td>Sweaty palms</td>
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<td>Drinking or smoking excessively</td>
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<td>Trembling</td>
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<td>Chronic fatigue</td>
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Tension is who you think you should be. Relaxation is who you are.

Chinese Proverb

![Stress Effects on the Body Diagram](image_url)
Look for psychopathology in caregivers and help them!
Therapies

- Behavior therapy to identify triggers and modify responses
- Cognitive therapy to identify and modify thoughts and feelings
- Supportive and individual therapy to identify environmental and social needs
Thank you.

Any Questions?