

### Medical Management of ADHD with Substance Abuse and other Co-Existing Conditions

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### Objectives

- Learn how substance use disorders affect medical treatment for ADHD
- Learn how other co-occurring conditions affect ADHD
- Learn use of medications and other modifications to treat ADHD in these patients with more than just ADHD

### Epidemiology

- 8-10 % of school age children and close to that number of adolescents meet criteria for one of the types of ADHD
- About 10% of high school students are involved in some type of drug or alcohol use on a regular basis, up to 25% on a frequent basis
- As many as 75% of adolescents with substance use disorders have co-occurring psychiatric conditions (Armstrong and Costello 2002)

### Predictors of Substance Use Disorders

- Socialization - characterized by a willingness to follow rules, accept adult supervision, and endorse conventional moral and ethical values.
- Other predictive traits social engagement, assurance, thrill seeking, and lack of anxiety and fear
- These in early adolescents predicted substance use by age 17

Iacono WG, Carlson SR, Taylor J, Elkins JJ, McGue M. Behavioral disinhibition and the development of substance use disorders: Findings from the Minnesota Twin Family Study. *Development and Psychopathology*. 1999; 11:869-900. [PubMed: 10624730]

### Neuroscience of Addiction

- “cortically regulated cognitive and emotional processes, which result in the overvaluing of drug reinforcers, the undervaluing of alternative reinforcers, and deficits in inhibitory control for drug responses.”
- Findings emphasize limbic-regulated responses to pleasure and reward
- Many other brain circuits involved

Goldstein and Volkow, Drug Addiction and Its Underlying Neurobiological Basis: Neuroimaging Evidence for the Involvement of the Frontal Cortex. *Am J Psychiatry*. 2002 October ; 159(10): 1642-1652.

### Neuroscience of Addiction

- Reward Deficiency Syndrome (RDS)
  - genetic variants in dopamine genes result in defective functioning of the reward system
  - more likely to seek out additional stimulation of their reward pathways by drugs, alcohol, excessive sexual activity and risk-taking activities

**Neurogenetic interactions and aberrant behavioral co-morbidity of attention deficit hyperactivity disorder (ADHD): dispelling myths**  
Comings and Chen, et al. *Theoretical Biology and Medical Modelling* 2005, 2:50

### Commonalities

- There are neurologic similarities
- Lack of neuroimaging of craving behavior
- If more symptomatic ADHD then cravings will be more intense

Review Comorbidity of ADHD and Substance Use Disorder (SUD): a neuroimaging perspective. Frodl T. J Atten Disord. 2010 Sep; 14(2):109-20

### Neurotransmitters and ADHD

- dopaminergic genes, DRD2, DAT1, and DBH, are associated with ADHD:
  - the severity of ADHD is most in those who have 3 out of 3 and less with 2 of 3 and least with 1 out of 3.

Attention-defi cit-hyperactivity disorder and reward deficiency syndrome. Blum, Chen, et al. Neuropsychiatric Disease and Treatment 2008:4(5) 893-917

### EEG in ADHD

- Their beta waves (brain waves associated with concentration) are low, and their theta waves (associated with relaxation) are high, suggesting a state of drowsiness and daydreaming.

Lubar JF. 1991. Discourse on the development of EEG diagnostics and biofeedback for attention-defi cit/hyperactivity disorders. *Biofeedback Self Regul*, 16:201-25.

### TOVA and CPT

- Multiple tests of attention with commission and omission tests
- Can provide some objective support for ADHD and possible monitoring of treatment
- Have been associated with many false negatives

Attention-defi cit-hyperactivity disorder and reward deficiency syndrome. Blum, Chen, et al. Neuropsychiatric Disease and Treatment 2008:4(5) 893-917

### ADHD and Addiction

- Neurobehavioral disorders that have behavioral consequences
- D4, dopamine D5, dopa decarboxylase gene, norepinephrine, adrenergic2a and 2c, COMT, tryptophan 2,3-dioxygenase, and GABA

Wallis D, Russell HF, Muenke M. 2008. Genetics of attention defi cit/hyperactivity disorder. *J Pediatr Psychol*, Jun 3 [Epub ahead of print].

### Overlap with ADHD and Addiction

- Many risk factors are the same
- Many neurotransmitters and functional areas of the brain are common to both
- Prevention efforts are often very similar
- Outcomes may be the same for a subset
- The two often seem to cause mutual worsening of symptoms and outcomes

### Evaluation of ADHD

- It is recommended that substance use history be taken in order to plan treatment sensitive to this risk
- Questions can be simple information gathering or can be motivational such as with motivational interviewing
- Early childhood history is very important
- What questions to ask?

### Questionnaires

- Vanderbilt
- Conners
- ASRS for older adolescents and young adults
- Many others
- These do not “make” the diagnosis

### Evaluation of Substance Use Disorders

- CAGE
- CRAFT
- Motivational interviewing
- Social history
- Legal history
- School history
- Family history

### CRAFT

- (1) Have you ever ridden in a CAR driven by someone (including yourself) who was ‘high’ or had been using alcohol or drugs?”
- (2) “Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?”
- (3) “Do you ever use alcohol or drugs while you are by yourself, ALONE?”
- (4) “Do you ever FORGET things you did while using alcohol or drugs?”
- (5) “Do your family or FRIENDS ever tell you that you should cut down on your drinking or drug use?”
- (6) “Have you ever gotten into TROUBLE while you were using alcohol or drugs?”

### Cage Questionnaire

- Have you ever felt you should Cut down on your drinking?
- Have people Annoyed you by criticizing your drinking?
- Have you ever felt bad or Guilty about your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (Eye opener)?
- **Scoring:**  
Item responses on the CAGE are scored 0 or 1, with a higher score an indication of alcohol problems. A total score of 2 or greater is considered clinically significant

### Motivational Interviewing Style

- Directive but non-authoritarian
- Patient centered, elicits patient’s goals
- Responsibility for change is patient’s
- Uses supportive strategies
- Avoids judgmental & argumentative language
- Explores patient’s ambivalence
- Moves toward change using patient’s own concerns and arguments

### How Do You Intervene with substance use disorders?

- Use family and friends as support
- Have referral resources ready if possible
- Present options for types of treatment
- Develop relationship with treatment center that has been effective for other patients

### Treatment

- Usually for ADHD therapy, modifications and medication are likely treatments
- For addictions or substance use disorders treatment is usually group therapy and education combined with mutual help groups such as AA or NA
- If both are present it is very important to treat both

### Modifications in Environment

- Educational system is a major stressor for ADHD and for substance using teens and young adults
  - Schools have great potential to help or hurt the situation
    - Encouragement toward achievable career goals
    - Teaching study habits and providing environment supportive of optimal learning
    - Engendering confidence and self efficacy in academics
    - Allowing extra time to complete tasks, tests, projects
    - Providing distraction free or reduced areas to complete some assignments or tests

### Modifications in Environment

- Coaching for ADHD can:
  - Help individuals to modify their own day to day functionality in all tasks large and small
  - Promote better relational function with other people
  - Help with directing career path
  - Assist in developing competency and self confidence
  - Provide observation and assisted self evaluation
  - Help time management strategies

### Psychotherapy

- Cognitive behavioral therapy (CBT) is being found to have more utility in treating ADHD symptoms and substance use symptoms
  - There are youtube videos that teach adolescents and young adults to do this on their own
  - There is more availability of CBT trained therapists
  - Some schools are providing CBT based programs for ADHD and substance using teens

### Psychotherapy

- Insight oriented therapy
  - Can be very helpful to anxiety, relational difficulties
  - Can help coach to some extent
  - Help self awareness

### Support Groups and Blogs

- CHADD
- ADDA
- Multiple blogs online

### Substance Use Treatment

- AA, NA and others that are similar
- Church involvement
- Intensive outpatient treatment
- Residential treatment

### Why Treat ADHD if You Have a Bigger Fish to Fry?

- Treating ADHD appears to allow for less craving of the drug of choice
- Appears to allow better integration and assimilation into the recovery program
- Appears to allow better stabilization of mood control and deferred gratification

### Medication Treatment

- What medications can be used for those with ADHD and substance use disorders?
  - Stimulants are still the most effective
  - There is evidence that ADHD treatment can be effective with stimulants
  - Treatment can be safe
  - There is some risk that ADHD stimulants will be sold to obtain their drug of choice
  - Non stimulants are not typically as effective as stimulants

### Medication Treatment

- Stimulants
  - Long acting are theoretically “safer” than short acting types
    - Risk may be more related to stimulating drug craving than the addict actually abusing the medication
    - ADHD stimulants may cause less effect of the highly addictive stimulants if taken in combination due to occupying the same receptors
    - Supplies may be given for a month at a time instead of 3 months at a time until a better relationship if established and trust can be built

### Medication Treatment

- Prescription monitoring programs can be very helpful to avoid a patient using multiple doctors to obtain more medication
- Corroborating reports from family can be obtained by requesting releases to be able to speak with family members, employers or boy/girl friends
- Some require attendance at AA, NA

### Misuse of Stimulants

- About 10% will sell, give away or take too much of their medication
- The goal of the majority of misuse or diversion is to treat ADHD symptoms or improve academic performance
- Take steps toward due diligence in assuring controlled substances are not over-supplied

Wilens TE, Gignac M, Swezey A, et al. 2006. Characteristics of adolescents and young adults with ADHD who divert or misuse their prescribed medications. *J Am Acad Child Adolesc Psychiatry*, 45:408-14.

### Other Co-morbidities

- What if the patient has depression?
- Mood instability vs. Bipolar Affective Disorder?
- Anxiety Disorders?
- Learning disabilities?
- Autism?
- Other co-morbidities should be treated as well

### Nonstimulant ADHD Treatment

- Strattera has been shown to be effective in children, teens and young adults for ADHD
  - However response rate is rather low
  - Response intensity is lower as well
  - There is no street value
- Wellbutrin has some benefit with ADHD symptoms but not very robust
  - Will usually help with co-morbid depression

### Alpha 2 Agonists

- Guanfacine and clonidine
  - Long acting forms may help with impulsiveness and overactivity
  - They have some positive work memory benefits but they are very mild
  - So they are not usually going to work well enough by themselves for cognitive difficulties of ADHD
  - They do have some positive effects on withdrawal symptoms for opioids

### Medications for Substance Use Disorders

- Disulfiram (Antabuse) – may give accountability to some extent
- Accamprosate may decrease craving for alcohol
- Naltrexone oral or intramuscular for alcohol or opioid dependence
- Cost of these is an issue except with disulfiram generic
- They all require recovery oriented treatment concurrently. They do not “cure” addiction

### Medications that provide some help with addiction

- Topiramate mild improvement in relapse rates
- Gabapentin also mild improvement
- Baclofen mild decrease in craving for alcohol
- Ondansetron mild decrease in craving and relapse in early alcohol dependence

### Jordan

- 15 y/o male brought in by father with worsening school problems. He has always struggled but is worse in the last several months
- Warned by school that he has too many tardies and may not get credit for first class in morning even if he is passing
- What else do you want to know about him?

### Jenny

- 19 year old who is sent by her attorney after having wrecked into another car and causing two deaths. Has struggled in school all her life. In college now but not doing well
- Has had one accident while driving before
- Has been more depressed since the accident but had some depression prior to the motor vehicle crash.
- What do you want to know?

### Matt

- 14 year old with ADHD and has been a straight A student until this year in 8<sup>th</sup> grade. Has been making Cs, Ds and Fs. Seems to be slowed down and is not focusing well. Still on the his ADHD medication but does not like the way it makes him feel.
- Saw his pediatrician a few months ago but was not doing as poorly at that point

### Nick

- 17 year old male with anger issues in the last few years. Not doing as well with school work and grades. Mom and dad are on the verge of divorce. Has been on ADHD medications on an off. He did well when on meds regularly but did not like them so keeps stopping on his own until the next crisis time
- What do you think might be going on?

### Summary

- ADHD is very common and shares many traits that are risk factors for substance use disorders
- ADHD treatment is very important to lessen chances of substance use disorders and in those who might be trying to enter recovery from addiction
- Well rounded non-medical and medical treatment are both often needed.