ADHD and Medication Management:
Use of medications for individuals with complex presentations
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Outline of Talk

• Co-morbidities associated with ADHD
• Complex presentations of common psychiatric comorbidities
• Pharmacotherapy

2014 ADHD Diagnostic Overview

47% ADHD Plus Co-Morbidity
53% ADHD Only
N=474
Current Age Breakdown 2014

N=474

Age Breakdown with Gender

N=221

2014 Co-morbid Diagnostic Breakdown

N=221
Multimodal Treatment Study of ADHD (MTA Study)

- After participants were identified, were determined to have met study criteria, and pre-treatment assessment measures were obtained, they were assigned at random to 1 of 4 treatment conditions.
  - medication alone;
  - psychosocial/behavioral treatment alone;
  - Combined treatment; or
  - routine community care.
- Fourteen months later, the participants were again assessed so that the impact of the different treatments could be evaluated.

Comorbidity - MTA Sample (N = 579)
Ages 7-9.9 years

- ADHD alone 129 (22.5%)
- ODD 129 (22.5%)
- Tic 54
- Conduct 43 (7%)
- Anxiety + ODD 87 (12%)
- Anxiety 58 (10%)
- Exclusions: PDD, Bipolar disorder, Psychosis, OCD, PDD
Comorbidity - PATS Sample (N = 303)  
Ages 3-5.5 years

Exclusions:
PDD  
Psychosis  
History of Bipolar disorder in both parents

ADHD and Medical Comorbidities

- Neurology- seizures, TBI, Concussion  
- Cardiology- structural defects, rhythm disturbances  
- Endocrine- Thyroid  
- Depending on age- heavy metal exposure, primary sleep disorders

Stimulant- Basic Principles

- Psychoeducation about medication options  
- FDA informed guidelines  
- Typically maximize dose of stimulant before switching medication (if no untoward side effect)  
- Consider use of adjunct non-stimulants along with stimulants before utilizing other psychotropic medications.
### Stimulant- Basic Principles

- Monitor Vital signs
- Planned breaks or decrease in dosage over summer
- Consider weight based dosing in very young children- not to over exceed recommended dosing
  - Methylphenidate & Atomoxetine (1 mg/kg)
  - Adderall (0.5 mg/kg)

### MTA at 8 year follow up

- Type or intensity of 14 months of treatment in childhood DOES NOT predict functioning 6-8 years later
- Early ADHD symptom trajectory regardless of treatment type is prognostic
- Future research to include measurement of impairments that bring families in for treatment and that are likely to mediate adulthood functioning.

### Stimulant medications and Growth

- At 5 year follow up of MTA study stimulants will affect growth
- Greater dose (mg/kg) given over prolonged periods of time without breaks could decrease both height and weight in the short term which could have impact on final growth parameters.

Charach et al; JAACAP 2006
Blood Pressure Over 10 Years in the MTA Study of Children With ADHD

Heart Rate Over 10 Years in the MTA Study of Children With ADHD

Cardiovascular monitoring- ADHD

- Most medications used to treat ADHD need monitoring of vital signs
- Generally consistent reports of small insignificant increases in mean heart rate and BP while using stimulants and atomoxetine
- Relationship between sudden cardiac death and stimulants not well established
- Recent large study notes increased cardiac risk twice as likely in stimulant users- complex time-dependent, dose-response relationship
Cardiovascular monitoring - ADHD

- Children who are adopted and below age 5 - consider getting an EKG
- Family history of arrhythmias, structural cardiac defects, sudden death below age 45 - consider referral to cardiologist for EKG and cardiac workup
- Multiple medications - consider getting an EKG
- Better to be safe always!

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<th>Trade Name</th>
<th>Generic Name (FDA Approved Medications)</th>
<th>Approved Age (years)</th>
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<tr>
<td>Adderall®</td>
<td>Mixed amphetamine salts</td>
<td>3 and older</td>
</tr>
<tr>
<td>Adderall XR®</td>
<td>Mixed amphetamine salts (extended release)</td>
<td>5 and older</td>
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<tr>
<td>Concerta®</td>
<td>OROS methylphenidate (sustained release)</td>
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Atomoxetine Hydrochloride (Strattera)

- First choice of non-stimulant medications (age 6 and beyond)
- To be considered first among active substance using, very anxious individuals
- Liver functions to be monitored
- Might have sedative effects in some individuals
- FDA black box warning - increase in suicidal thoughts
- Weight based dosing (1-1.5 mg/kg)
Alpha 2 Agonists

- Meta-analysis reported that alpha 2 agonists were more effective than placebo both in monotherapy and as add-on to stimulants.
- Side effects - hypotension, bradycardia, fatigue, somnolence and sedation

Modified Clinical Algorithm for ADHD

Long Acting Amphetamine or Methylphenidate

Alternate Stimulant not used in above step

Atomoxetine

Bupropion

Alpha 2 agonists

Combination of Stimulants and Alpha 2 agonists

Stimulant plus Strattera (?)

Stimulant plus Bupropion (?)

ADHD meds for children less than age 6

- Consider behavioral therapy as first line
- If symptoms persist - start with low dose short acting stimulant (methylphenidate/mixed amphetamine salts), later convert to long acting as appropriate
- Monitor closely for side effects - too quiet (zombie effect → high dose?), irritability secondary to med withdrawal, vitals, sleep
**Comorbidities & medications?**

- Results from PATS study indicate
  - ADHD alone - better response
  - Increasing comorbidities - poor response
  - More than 3-4 comorbid disorders - minimal to no response

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**ADHD with ODD and Aggression**

- 40-70% of children with ADHD may have ODD or CD
- Use an aggression subscale to monitor (Iowa Connor scale)
- Children with early onset of aggression - greatest risk of poor outcome
- Almost always require psychosocial interventions
- If usual treatments fail - try mood stabilizers vs atypical antipsychotics

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**Meds – ADHD & ODD/Aggression**

- Titrate stimulant for ADHD
- ODD - Behavioral therapy is treatment of choice
- If aggression persists beyond symptomatic improvement of ADHD symptoms consider
  - Alpha 2 agonists
  - Bupropion
  - Consider atypical antipsychotic - low dose but note that this is only to address aggression - for potential discontinuation in future
**ADHD and PTSD**

- Youth with ADHD are more likely to develop PTSD and vice-versa
- 30% of adults with PTSD had a childhood history of ADHD
- Both disorder share familial risk factors and their aggregation is not by chance
- Increase comorbidities (depression, substance use) among individuals with ADHD+PTSD

*Antshel KM et al; J Clin Psychiatry 2013*

**ADHD and Child Protective Services (CPS)**

- Children involved with CPS are diagnosed and treated for ADHD at higher rates
- These children receive more psychotropic medication (3-11 times higher than general population)
- 41% of children in foster care are on 3 or more psychotropics
- ADHD is the most commonly diagnosed disorder (upto 38%)
- No clear guidelines for medication management-multiple comorbidities which make it difficult to diagnose psychiatric disorders

*Klein B et al; Child: Care, Health and Development 2014*

**ADHD and Mood Disorders**

- ADHD and Depression often co-occur and pose diagnostic challenges when full criteria for disorders are not met
- Evaluate Mood disorder symptoms thoroughly getting corroborative information
- What to treat first- MDD or ADHD
  - No clear guidelines on treating comorbidities
ADHD and Mood Disorders

- Treat the most compelling disorder first. If improvement occurs but has no effect on the second diagnosis treat the second diagnosis.
- If the first condition, does not improve stop the treatment and treat the second condition.
- Consider what is driving the presentation
  - Low self esteem from ADHD \(\rightarrow\) mimics depression
  - Neurocognitive changes in depression \(\rightarrow\) mimics ADHD
  - Stimulant induced dysphoria \(\rightarrow\) mimics depression

Meds- ADHD and Depression

- Consider what is driving the presentation
  - Low self esteem from ADHD \(\rightarrow\) mimics depression
    - Treat ADHD first
  - Neurocognitive changes in depression \(\rightarrow\) mimics ADHD
    - Treat depression (SSRIs)
  - Stimulant induced dysphoria \(\rightarrow\) mimics depression
    - Consider decreasing dose / decreasing AM long acting dose and adding immediate release as prn
    - Drug holidays

ADHD and Bipolar disorder

**Mania**
- Elevated expansive mood
- Irritable mood
- Pressured speech
- Decreased need for sleep and not tired next day
- Grandiosity
- Symptoms are DISTINCT change in function

**ADHD criteria**
- Class clown, attention seeking
- Low frustration tolerance, temper tantrums
- Talks a lot
- Difficulty falling asleep and cranky next day
- Impulsive, don’t care about danger
- CHRONIC symptoms starting before age 12
Meds: ADHD and Bipolar Disorder

- Consider family history
- Typically ADHD is treated first and episodic symptoms might provide a clue in diagnosing bipolar disorder
- Report from others- parents, peers, spouse/partner noticing acute changes from baseline (examples- sleep, energy, hygiene, functioning)
- Mood stabilizers
  - Lithium, Depakote
  - Atypical antipsychotics

Meds: ADHD and Anxiety

- Baseline screening of anxiety is very important
- Consider stimulant induced/worsening of anxiety symptoms
- Consider Atomoxetine and reassess anxiety
  - If anxiety persists or stimulants are the only meds that work well
    - Consider addition of SSRI
  - Could use benzodiazepines in short term with definite plan of discontinuation

ADHD and Anxiety Disorders

- One in 4 children with ADHD- anxiety disorder
- 15-30% of children presenting for anxiety disorder meet diagnostic criteria for ADHD
- More problems with low self esteem complicated by low academic and social functioning in schools.
- MTA study – more effect for combined approach
- Strattera more helpful
ADHD and OCD

- Almost 1/3 of children with OCD might have ADHD
- Both disorders have to be treated separately
- Behavioral treatment key to OCD
- Consider non-stimulants
- Stimulants might worsen symptoms of OCD
- OCD- ERP is the treatment of choice
  - Might require high doses of SSRI

ADHD and Learning Disorders

- 25-40% of individuals with ADHD meet criteria for a specific learning disorder (reading disorder, math, disorder of written expression)
- Treating ADHD with meds will not address LD
- Treating ADHD might help with executive functioning in turn benefitting LD
- Accommodations and IEP will help LD
- If there is overall academic improvement on stimulants but lack of improvement in one specific topic (ex: math or reading), consider Learning disorder

ADHD and Substance Use Disorders

- ADHD confers increased risk for future SUDs.
- Stimulants/medications have no impact on this risk.
- Cautious pharmacotherapy in these cases
- If SUD are impairing, they need to be addressed first
**Meds: ADHD & Substance Use**

- Consider Atomoxetine as first line
- If using stimulants-set clear boundaries about medication protocol – lost/stolen/early refills
- Urine Drug Screening- Random and include screening for stimulants (to check adherence)
- Collaborate with pharmacists

**ADHD and Autism**

- Both are neurodevelopmental and early onset- difficult to distinguish
- Can diagnose both at this time
- High percentage of children with Autism (upto 50%) are treated for ADHD
- Cautious use of medications- might not work in the typical fashion
- No specific medication for autism itself

**Meds: ADHD and Autism**

- Consider different strategies for medication administration
  - Liquid/chewable – methylphenidate IR preparations
  - Quillivant- long acting methylphenidate liquid
  - Daytrana patch
  - Vyvanse – can dissolve in liquid
  - If patient can swallow without chewing- most XR preparations can be sprinkled
ADHD and Tics

- Upto 50% of children with Tourettes might also have ADHD
- Stimulants can exacerbate but not cause tics-present idea
- Tics- normal course- wax and wane
- Use alpha 2 agonist which may help with tics.
- Consider low dose atypical antipsychotics

ADHD and Sleep Issues

- Sleep issues are very commonly seen in children with ADHD
- Difficulty falling asleep – common complaint
- Sleep hygiene – first line of treatment
- Consider primary sleep disorders
  - Adenoids and tonsils- breathing issues
  - Sleep walking, talking, night terrors
- Consider sleep study
**Meds: ADHD and Sleep issues**

- Insomnia might attenuate after 1-2 months of stimulant use.
- No stimulant medication after 4-5 pm. However, there might be paradoxical benefit of adding short acting stimulant at 4pm (if rebound effect occurs)
- Switch alternative class of stimulant or consider atomoxetine
- Typically benzodiazepines are not utilized. If necessary, consider it for a short period of time.
- Medications for sleep
  - Melatonin (immediate and sustained release)
  - Cyproheptadine
  - Trazodone
  - Mirtazapine (along with low weight)
  - Hydroxyzine

**ADHD and Psychosis**

- Stimulants might cause psychotic symptoms in high doses (or regular doses in certain individuals)
- If prior history of ADHD and stable on antipsychotic medication, could consider a careful trial of stimulants
- ADHD confers higher risk for psychosis (Risk ratio of 3) after 31 year follow up period
- Strattera could be potentially beneficial

Dalsgaard et al; Eur Psychiatry 2014
ADHD and Multiple Comorbidities

• ADHD plus two or more comorbidities might be difficult to treat
• More careful approach in teasing apart the symptoms
• Good biopsychosocial formulation for such cases might be helpful in treatment planning

Referral Information and Acknowledgment

• ADHD Across the Lifespan Clinic
  – 412-246-6090
Many thanks to patients and their families, clinicians, physicians, front desk staff and administrative leadership at WPIC
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That’s It ! Questions?