Medication Management: ADHD

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ADHD - Etiology

• Neurobiology
  – Neurotransmitters
    • Norepinephrine
    • Dopamine
    • Others
ADHD - Comorbid conditions

- Learning Difficulties/Learning Disabilities
- Oppositionality and Conduct problems
- Aggressive Outbursts
- Tic Disorders
- Anxiety Disorders
- Mood Disorders
- Developmental Coordination Disorder
- Substance Abuse
ADHD - Treatment

• NIMH Multimodal Treatment Study of ADHD (MTA Study)

  – Four groups:
    1. Community Care (CC)
    2. Medication Management (MedMgt)
    3. Behavioral (Beh)
    4. Combination (Comb)

  – Results:
    • Comb & MedMgt superior to Beh and CC for ADHD
    • Comb superior to MedMgt, Beh and CC for other areas
ADHD - Treatment

MTA Study

- **Treatment Approach Rules Of Thumb:**
  - ADHD-only or ADHD/CD-ODD $\Rightarrow$ MedMgt +/- Comb
  - ADHD/Anxiety-only $\Rightarrow$ MedMgt, Beh or Comb
  - ADHD/Anxiety/CD-ODD $\Rightarrow$ Comb
ADHD - Treatment

• Medications
  – To address core ADHD features
  – To address comorbid features
ADHD – Treatment

Key points for medications

• Medication is an integral *part* of treatment.
• Medication is *not* used for controlling behavior.
• Eyeglasses as an analogy
• Success is attributed to oneself, not to medication
• Avoid “poly-pharmacy” when possible
ADHD - Treatment

- Medications for core ADHD features
  - Psychostimulants
  - Non-psychostimulants
ADHD - Treatment

**Core ADHD features:**

- Impulsivity
- Inattention
- Hyperactivity
- Distractibility
ADHD - Treatment

Psychostimulants

• First used in 1937
• They do not increase one’s stimulation
• Very effective
• When ineffective after adequate trial, reconsider the diagnosis
ADHD – Treatment

Psychostimulants

• **Advantages**
  – the most effective Rx option for core ADHD features

• **Disadvantages**
  – little direct effect on social skills or academics
  – may cause attention overfocusing
  – potential for abuse
  – side effects
ADHD - Treatment

Psychostimulants – Key Points

• “START LOW, GO SLOW”!!

• IF ONE DOESN’T WORK, TRY ANOTHER!!

• IF INEFFECTIVE WITH PROPER TRIAL, RECONSIDER DIAGNOSIS!!
ADHD - Treatment

Psychostimulants – Key Points

- Long-acting and short-acting available
- Sometimes will use long- and short-acting together
- Consider double-blind, placebo-controlled trial
- Effect is “immediate”
ADHD - Treatment

Psychostimulants – Key Points

- If sudden loss of efficacy, not likely due to medication failure
- Usually should take medication 7 days/week
- ADHD is lifelong, and medication may or may not be a continued part of management
- Periodic trials without medication are suggested
- Less likely to abuse drugs as adolescents
ADHD - Treatment

Psychostimulants – Side effects

• Usually mild and short-term
• Appetite reduction
• Sleep difficulty
• “Rebound”
• Headache
• Stomachache
• Possible growth impact
• Possible cardiovascular side effects
• They DO NOT cause tics or Tourette syndrome!!!
ADHD – Treatment

Medications for core ADHD features

Psychostimulants

- **Methylphenidate**
  - Ritalin [LA,SR], Concerta
  - Metadate CD,ER, Methylphenidate [ER]
- **Dexmethylphenidate**
  - Focalin
- **Dextroamphetamine**
  - Dexedrine [Spansule], Dextrostat
- **Mixed amphetamine salts**
  - Adderall [XR]
- **Pemoline**
  - Cylert

Non-psychostimulants
ADHD – Treatment

Medications for core ADHD features

Psychostimulants

- Methylphenidate
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Non-psychostimulants
ADHD – Treatment

Medications for core ADHD features

**Psychostimulants**

- Methylphenidate: Ritalin [LA,SR], Concerta
  - Metadate CD,ER, Methylin [ER]
  - Focalin
- Dexmethylphenidate
- Dextroamphetamine: Dexedrine [Spansule], Dextrostat
- Mixed amphetamine salts: Adderall [XR]
- Pemoline: Cylert

**Non-psychostimulants**
ADHD – Treatment

Medications for core ADHD features

**Psychostimulants**

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  - Cylert

**Non-psychostimulants**
ADHD – Treatment

Medications for core ADHD features

**Psychostimulants**

- Methylphenidate
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- Dexmethylphenidate
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- Pemoline

**Non-psychostimulants**
ADHD – Treatment

Medications for core ADHD features

**Psychostimulants**

**Non-psychostimulants**
- Norepinephrine Reuptake Inhibitor
- Alpha adrenergic agonists
- Antidepressants
- Anticonvulsants/Mood stabilizers
- Neuroleptics
ADHD – Treatment

Medications for core ADHD features

Non-psychostimulants

**Advantages**
- May avoid psychostimulant side effects
- May be used with stimulants for effect augmentation or dose reduction
- Many treat comorbid conditions of ADHD

**Disadvantages**
- None works as well as psychostimulants (uncertain re: Strattera)
- All have side effects
ADHD – Treatment

Medications for core ADHD features

Non-psychostimulants

NE Reuptake Inhibitor

- atomoxetine (Strattera)
  - No abuse potential (not a controlled substance)
  - Few studies comparing atomoxetine with psychostimulants
  - Appetite suppression is most common side effect
  - No cardiovascular effects
  - Usually once daily dosing
ADHD – Treatment

Medications for core ADHD features

Non-psychostimulants

**Alpha adrenergic agonists**

- clonidine (Catapres) (**Esp. useful if used with stimulant**)
- guanfacine (Tenex)
ADHD – Treatment

Medications for core ADHD features

Non-psychostimulants

Antidepressants

• tricyclics (*The most studied non-stimulant for ADHD*)
• SSRIs
• others
ADHD – Treatment

Medications for core ADHD features
Non-psychostimulants

Antidepressants

• tricyclics (“TCAs”) (*Patience!! 3 weeks for full effect*)
  – imipramine (Tofranil)
  – nortriptyline (Pamelor)
  – amitriptyline (Elavil)
  – clomipramine (Anafranil)
  – protriptyline (Vivactil)
  – desipramine (Norpramin)

• SSRIs
• others
ADHD – Treatment

Medications for core ADHD features

Non-psychostimulants

Antidepressants

• tricyclics

• SSRIs (*Ineffective for ADHD, but great for comorbidity*)
  – fluoxetine (Prozac)
  – sertraline (Zoloft)
  – paroxetine (Paxil)
  – fluvoxamine (Luvox)
  – citalopram (Celexa)

• others
ADHD – Treatment

Medications for core ADHD features

Non-psychostimulants

Antidepressants

- tricyclics
- SSRIs
- others
  - bupropion (Wellbutrin) (The only established one for ADHD)
  - venlafaxine (Effexor)
  - mirtazapine (Remeron)
  - nefazodone (Serzone)
ADHD – Treatment
Medications for core ADHD features

Non-psychostimulants

Anticonvulsants/Mood stabilizers (effective, but not advised)

• Carbamazepine (Tegretol)
• Lithium
• Valproic acid (Depakote)
ADHD – Treatment
Medications for core ADHD features
Non-psychostimulants

Neuroleptics (effective but inadvisable)
- Risperidone (Risperdal)
- Olanzapine (Zyprexa)
ADHD – Treatment

Medications for comorbid features

- Tics/Tourette’s
- Insomnia
- Aggression
- Anxiety/Obsessions-Compulsions
- Mood disorders
- Enuresis (wetting)
ADHD – Treatment

Medications for comorbid features

– Tics/Tourette’s
  • Stimulants
  • Alpha adrenergic agonists
  • Neuroleptic agents
    – atypical neuroleptics
    – typical neuroleptics
  • Add a beta-blocker
  • TCA
ADHD – Treatment

Medications for comorbid features

– Insomnia
  • Alpha adrenergic agonists
  • TCAs
ADHD – Treatment

Medications for comorbid features

– Anger/Aggression
  • Anger: SSRI
  • Aggression: clonidine or carbamazepine
ADHD – Treatment

Medications for comorbid features

- Anxiety/Obsessions-Compulsions
  - Anxiety: SSRIs and TCAs
  - Obsessions-Compulsions: SSRIs
ADHD – Treatment

Medications for comorbid features

- Mood Disorders
  - Depression: SSRIs, Bupropion, and TCAs
ADHD – Treatment

Medications for comorbid features

- Enuresis (wetting)
  - TCAs
  - DDAVP
ADHD – Treatment

Non-medication approaches

• Complementary and Alternative Therapies
  – Guidelines from the National Institutes of Health
    • Assess the safety and effectiveness of the therapy
    • Examine the practitioner’s expertise
    • Consider the service delivery
    • Consider the costs
    • Consult your healthcare provider
ADHD – Treatment

Non-medication approaches

– “Alternative” approaches
  • Dietary eliminations
  • Biofeedback/Hypnotherapy
  • Chiropractic
  • Homeopathy
  • Herbs and dietary supplements
ADHD – Treatment

Non-medication approaches

– “Alternative” approaches
  - Dietary eliminations
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  - Chiropractic
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  - Herbs and dietary supplements
ADHD – Treatment

Non-medication approaches

• “Alternative” approaches:
  – Herbs and dietary supplements
    • Safety
    • Classes of agents
      – Sedative herbs and supplements
      – Antioxidant supplements
      – Other popular herbs and supplements
ADHD – Treatment

Non-medication approaches

• “Alternative” approaches:
  – Herbs and dietary supplements: Classes
    • Sedative herbs and supplements
      – Valerian
      – Lemon balm
      – Kava kava
      – Melatonin
    • Antioxidant supplements
    • Other popular herbs and supplements
ADHD – Treatment

Non-medication approaches

• “Alternative” approaches:
  – Herbs and dietary supplements
    • Sedative herbs and supplements
    • Antioxidant supplements
      – Fish oil
      – Pycnogenol (grape seed and pine bark)
    • Other popular herbs and supplements
ADHD – Treatment

Non-medication approaches

• “Alternative” approaches:
  – Herbs and dietary supplements
    • Sedative herbs and supplements
    • Antioxidant supplements
    • Other popular herbs and supplements
      – Ginkgo biloba
      – Evening primrose oil
      – Blue-green algae
ADHD RESOURCES: Medication Information

- **Children and Adults with ADHD (CHADD)**
  - www.chadd.org

- **Nat’l Initiative for Children’s Healthcare Quality (NICHQ)**
  - www.nichq.org

- **National Institute of Mental Health (NIMH) – ADHD Q&A**
  - www.nimh.nih.gov/publicat/adhdqa.cfm

- **NICHQ ADHD Toolkit**
  - www.nichq.org/resources/toolkit
ADHD - Treatment

TAKE-HOME POINTS

• Comprehensive management is needed
• Medications are likely useful
• Stimulants generally the best first choice
• Efficacy of any medication is unpredictable
• Don’t overlook comorbid conditions