Psychopharmacology in Children & Adolescents

Susan Sharp, D.O.
Department of Psychiatry and Behavioral Sciences
Kansas University Medical Center
Treating Children and Adolescents

- Diagnostic hypothesis guides intervention
- Pay careful attention to any comorbidity and differential diagnosis
  - Especially any associated learning disorder or cognitive deficit
- Pharmacotherapy is only part of the treatment plan
  - Therapies, parental counseling and education, accommodations at school
Treating Children and Adolescents

- Family and child must be aware of risks, benefits, possible side effects or adverse events, and any alternative treatments.
- Start low and go slow.
- After sufficient period of stabilization (often 6-12 months) may evaluate need for continued treatment.
- Still need more data on efficacy and safety of medications in children.
Major Classes of Drugs Used

- Stimulants
- Antidepressants
- Antipsychotics
- Mood stabilizers
- Others
Stimulants

- Use: First class of drugs reported to be effective in treatment of behavioral disturbances in children with ADHD
- Mechanism of action: Enhance dopamine and norepinephrine by blocking reuptake and sometimes increasing release
- Medications: Short acting and long acting forms
Stimulants
Shorter Acting

- **Methylphenidate (Ritalin, Focalin, Methylin)**
  - Total daily dose ranges from 0.3-2mg/kg
  - Dose bid or tid, usually lasts 4 hours

- **Detroamphetamine (Dexedrine)**
  - Total daily dose ranges from 0.3-1mg/kg
  - Dose bid-tid, lasts approx. 6 hours

- **Mixed amphetamine salts (Adderall)**
  - Total daily dose ranges from 0.5-1mg/kg
  - Dose once daily to bid, lasts 4-6 hours
Stimulants
Longer Acting

- Methylphenidate products (Concerta, Metadate CD, Ritalin LA, Focalin XR)
  - Last 10-12 hours
- Mixed Amphetamine Salts (Adderall XR)
  - Lasts 10-12 hours
Stimulants
Side Effects

- Insomnia
- Decreased appetite
- Weight loss
- Stomachache
- “Rebound effects” (usually with short acting)
- Moodiness/ irritability/ crying
- Increased anxiety
- Increases in heart rate/blood pressure
- Increased lethargy
- Tics?
Avoid in children with heart murmurs or structural cardiac abnormalities or other serious heart problems

- [www.fda.gov/cder/drug/advisory/adderall.htm](http://www.fda.gov/cder/drug/advisory/adderall.htm)
Antidepressants

SSRIs

Use- Depression and Anxiety disorders
Mechanism of action- Block reuptake of serotonin
Examples- Prozac, Zoloft, Celexa, Lexapro, Paxil, Luvox
Antidepressants

- **Atypical antidepressants**
  - Use: anxiety, depression, ADHD
  - Mechanism of action: affect the release and reuptake of brain neurotransmitters including serotonin, norepinephrine, and dopamine.
  - Examples: Wellbutrin, Remeron, Effexor
  - Side effects: activation, sedation, weight gain depending on medicine
Antidepressants

Tricyclic antidepressants

- Use: ADHD, Enuresis, OCD
- Mechanism of action: increase serotonin and norepinephrine
- Examples: Amitriptyline (Elavil), Clomipramine, Imipramine, Nortriptyline
- Side effects: dry mouth, constipation, sedation. Must follow levels and monitor EKGs baseline and during treatment. Watch for drug interactions. Lethal in overdose.
Antidepressants

Warnings - Risk of Suicidal Ideation

- October 2004, FDA issued statement for antidepressants to revise their labeling to include a boxed warning and expanded warning statements about the increased risk of suicidality in children and adolescents being treated with antidepressants

- www.parentsmedguide.org
Antipsychotics

Novel Atypical Antipsychotics

- Use: Psychosis, mania, aggression, self-injurious behaviors in children with mental retardation and pervasive developmental disorders, Tourette’s
- Mechanism of action: block specific dopamine and serotonin neurotransmitters (except Abilify)
- Examples: Risperdal, Seroquel, Zyprexa, Geodon, Abilify
Antipsychotics

 Novel Atypical Antipsychotics cont.

- Side Effects- drowsiness, increased appetite, weight gain, insomnia, extrapyramidal effects-dystonias, restlessness, parkinsonism, possible increases in QTc interval on EKG.
Antipsychotics

- Typical antipsychotics
  - Uses- same as atypicals
  - Mechanism of action- Dopamine antagonists
  - Examples- Haldol, Prolixin, Orap
  - Side effects- Some more likely to cause extrapyramidal side effects
Mood Stabilizers

- Lithium
  - Use: For bipolar disorder and can augment treatment for depression
  - Exact mechanism of action unknown
  - Side effects: nausea/vomiting, polyuria, polydipsia, tremor, sedation, weight gain, acne, decreased thyroid function
  - Monitoring: blood levels, kidney, thyroid functions
Mood Stabilizers

- Lithium cont.
  - Avoid giving with NSAIDs, and certain diuretics which can increase lithium levels.
Mood Stabilizers

- Valproic Acid (Depakote)
  - Use: Bipolar disorder, aggression, anticonvulsant
  - Side effects: sedation, nausea, thinning of hair, weight gain, bone marrow suppression, liver toxicity (both rare), teratogenic
  - Monitor: levels, liver function tests, blood counts, renal function
Mood Stabilizers

➢ Tegretol

- Use- Bipolar disorder
- Side effects- dizziness, sedation, nausea, bone marrow suppression, liver toxicity, skin disorders (including Stevens-Johnson syndrome), teratogenic
- Monitor levels, liver function tests, blood counts, renal function
Mood Stabilizers

- **Trileptal**
  - Use - Bipolar disorder but limited data
  - Similar structure to tegretol, but does not require the same blood monitoring
  - Side effects - Dizziness, headache, sedation, nausea, hyponatremia
Mood Stabilizers

- **Lamictal**
  - Use: Bipolar disorder, need more studies
  - Anticonvulsant
  - Side effects: Dizziness, sedation, headache, nausea, lack of coordination, insomnia, rash (Steven’s Johnson Syndrome)
Other Medications

- **Alpha-Adrenergic Agonists**
  - **Uses**: ADHD, aggression, Tourette’s
  - **Mechanism of action**: Stimulates alpha 2-adrenoreceptors in brainstem, thus activating an inhibitory neuron, resulting in decreased sympathetic outflow
  - **Examples**: Clonidine, Tenex
  - **May give once, twice, or three times/day**
  - **Side effects**: sedation, hypotension, dry mouth, depression
Strattera

- Uses - ADHD
- Mechanism of action - Norepinephrine reuptake inhibitor
- Doses - 0.5-1.2 mg/kg/day
- Side effects - Sedation, mild appetite suppression
- Monitor for evidence of liver injury
Conclusion

- Consider pharmacotherapy as part of a broader treatment plan
- Assess potential risks, benefits, side effects, and alternatives
- Identify target symptoms and carefully monitor progress
- Have realistic expectations
- Research