Psychotropic Medications Used in Childhood

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Sagital View of the Brain

- cerebral cortex
- corpus callosum
- thalamus
- cerebellum
- spinal cord
- medulla
- pons
- hypothalamus
- midbrain
Stimulant Medication

- Methylphenidate (Ritalin, Concerta, Focalin, Ritalin SR, Ritalin LA)
- Amphetamines (Dexedrine, Adderall, Adderall XR)
- Mechanism of action not completely understood
- Stimulants act by causing release of catecholamines from the dopamine axons and blocking their reuptake.
Stimulant Medication

- Stimulant medication is used to treat attention deficit hyperactivity disorder (ADHD).

- In the classroom, stimulants decrease interrupting and motor restlessness, increase on-task behavior, and reduce ADHD symptoms.
Stimulant Medication

- At home, stimulants improve parent-child interactions, on-task behavior, homework completion, and compliance.

- Stimulants may improve the symptoms of comorbid conduct disorder or comorbid anxiety disorder.
Stimulant Medication

Common side effects of stimulant medication include:

- Headache
- Stomachache
- Decreased appetite
- Jitteriness
- Insomnia
Adrenergic Agonists

- Clonidine (Catapres)
- Guanfacine (Tenex)

- First developed as antihypertensive agents.
- Alpha-2 adrenergic agonists have effects on norepinephrine (NE) and other neurotransmitter systems.
Adrenergic Agonists

- Used in the treatment of:
  - ADHD
  - Aggressive Behavior
  - Insomnia

- There have been several case reports of sudden death in children on the drug combination Ritalin and Clonidine.
Adrenergic Agonists

- Common side effects of adrenergic agonists include:
  - Dry mouth
  - Drowsiness
  - Dizziness
  - Sedation
  - Hypotension and bradycardia
  - Fatigue
Selective Serotonin Reuptake Inhibitors (SSRIs)

- Fluoxetine (Prozac)
- Sertraline (Zoloft)
- Paroxetine (Paxil)
- Fluvoxamine (Luvox)
- Citalopram (Celexa)
- Escitalopram oxalate (Lexapro)
Selective Serotonin Reuptake Inhibitors (SSRIs)

- SSRIs used to treat a variety of disorders:
  - Major Depression
  - Social Anxiety (Social Phobia)
  - Generalized Anxiety Disorder (GAD)
  - Post Traumatic Stress Disorder (PTSD)
  - Eating Disorders
  - Obsessive Compulsive Disorder (OCD)
Selective Serotonin Reuptake Inhibitors (SSRIs)

- Common side effects of SSRIs include:
  - Sexual dysfunction
  - Nausea
  - Drowsiness
  - Constipation
  - Nervousness
  - Fatigue
Selective Serotonin Reuptake Inhibitors (SSRIs)

- Common side effects of SSRIs:
  - Headache
  - Dizziness
  - Dry mouth
  - Insomnia
  - Restlessness
  - Tremor
Atypical Antipsychotics

- Clozapine (Clozaril)
- Olanzapine (Zyprexa)
- Quetiapine (Seroquel)
- Risperidone (Risperdal)
- Ziprasidone (Geodon)
- Aripiprazole (Abilify)
Atypical antipsychotic medications are used to treat a range of problems in children and adolescents.

Clinical effects of the antipsychotic agents are related to their affinity for a variety of receptors in the central nervous system (dopamine, muscarinic, alpha-adrenergic, and histamine receptors).
Atypical Antipsychotics

- Side effects of atypical antipsychotic medications include:
  - Extrapyramidal side effects (acute dystonic reactions (ADRs), drug-induced Parkinsonism, and akathisia)
  - Tardive dyskinesia (characterized by choreoathetoid movements)
    - Seizures
    - Weight Gain
Atypical Antipsychotics

- Additional side effects include:
  - Liver dysfunction
  - Sedation
  - Anticholinergia (dry mouth, blurred vision, constipation, urinary retention, & tachycardia)
  - Cardiovascular effects (hypotension, QTc prolongation).
Mood Stabilizers

- Lithium carbonate (Eskalith)
- Divalproex sodium (Depakote)
- Gabapentin (Neurontin)
- Topiramate (Topamax)
- Carbamazine (Tegretol, Carbatrol)
- Lamotrigine (Lamictal)
Mood Stabilizers

- Lithium is used to treat mania in adolescents and adults with bipolar disorder.

- Precise neurobiological mechanisms through which lithium reduces acute mania remain uncertain.

- Common side effects—neuronal, gastrointestinal, ocular, and urinary.
Mood Stabilizers

- Depakote—hypotheses about mechanisms of action include its enhancement of GABA accumulation in several cerebral regions.

- Common side effects—tremors, thrombocytopenia, alopecia, diarrhea, vomiting, anorexia (seen with high plasma levels).
Mood Stabilizers

- Neurontin—may have antimanic efficacy in adults with bipolar disorder.

- Precise mechanism of action unknown.

- Common side effects are somnolence, dizziness, and asthenia.
Mood Stabilizers

- Topamax—has shown preliminary antimanic and possibly antidepressant efficacy in treatment-refractory, manic patients with bipolar type I.

- Mechanism of action is unknown.

- Common side effects are somnolence and anorexia.
Mood Stabilizers

- Tegretol—used to treat children with a variety of behavior problems.

- The molecular effects underlying Tegretol’s mood stabilizing effects not established.

- Common side effects include leukopenia, skin rash, dizziness, diplopia, neutropenia, agranulocytosis.
Mood Stabilizers

- Lamictal—sodium channel blocker.

- May have a bimodal spectrum of efficacy in the treatment of bipolar disorder.

- Common side effects include ataxia, dizziness, diplopia, headache, and skin rash.
Psychotropic medications are prescribed frequently to treat various childhood behavioral disorders (ADHD, CD, OCD, BD, etc.).

Mechanism of action of most psychotropic medications is unknown.

Polypharmacy is common; we need to watch for drug-drug interactions and side effects.
Medication References for Teachers

- helping parents, youth, and teachers understand medications for behavioral and emotional problems, by mina k. dulcan, m.d. and claudia lizarralde, m.d.
- american academy of child and adolescent psychiatry (www.aacap.org)
- center for health and health care in schools (www.healthinschools.org)