

Update on the Use of Psychotropic Medication in the Treatment of Adolescents with Psychiatric Disorders

Presented by:

Brian McKain, RN, MSN

Disclaimer

- **The content of this presentation is for informational purposes only. It should not be used to diagnose a health problem, and it is not intended to replace the medical advice of a qualified health professional.**

Overview of Presentation

- Physiology
- Medication
 - antidepressant
 - mood stabilizer
 - anxiolytic
 - antipsychotic
 - stimulant

Overview continued

- Terminology and concepts: therapeutic efficacy and its relationship to side effects
- Delivery system: making it to the brain
- Medication and classifications: how they work and related side effects
- Future direction: evolving theory and hopeful prospects

Psychopharmacology

- Psycho - the mind
- Pharmacology - medication
- medication- used to treat the mind (specific 'mental' disorders)
- Physiologic concepts
- Nothing is truly in your body until it is in your blood stream (Chaffee, 1976)

The Role Of The Liver

- 'Delivery' to the blood stream: mucus membrane (gastrointestinal), skin, muscle, directly injected to the blood vessel
- 1st pass to the liver
- Into the blood stream
- Into the brain
- Adolescent vs. adult metabolism

Cytochrome 450 (CYP 450)

- Enzyme system
- Increases or decreases the amount of certain enzymes which in turn effects the metabolism of the medication

Therapeutic Blood Level

- Conceptualization: therapeutic window
- Half life of medication and a 'steady state'

Medication Classifications

- Antidepressants
- Mood Stabilizers
- Anti-anxiety agents
- Anti-psychotics
- Stimulants

Conceptualizing The Treatment Of Mood Disorders

- Theorized that the monoamine neurotransmitter systems are some how altered (particularly NE and serotonin)
- Underactivity in depressive episode and overactivity in manic episode

Kindling

- A concept theorizing that there is an alteration in the neurotransmission which is initiated by stress resulting in the first onset of depression.
- There is a 'sensitization' with less stress necessary to result in another episode of mania or depression.
- Results in a sustained alteration in neuronal functioning.

Medication classification

- Antidepressants

Antidepressants

- Tricyclic Antidepressant (TCA)
- Monoamine Oxidase Inhibitor (MAO-I)
- Selective Serotonin Re-uptake Inhibitor (SSRIs)
- Novel Antidepressants

Tricyclic Antidepressants (TCA)

Generic:

- Amitriptyline
- Desipramine
- Imipramine
- Nortryptiline
- Clomipramine

Brand:

- Elavil/Endep
- Norpramin/Pertofrane
- Tofranil/Janimine
- Aventyl/Pamelor
- Anafranil/Placil

TCA: Physiologic Action

- Blocks reuptake of NE and or serotonin
- Resulting in more NE and/or Serotonin present at the synapse

Tricyclic Antidepressants

Side Effects:

Dry mouth

Fatigue/drowsiness

Urinary retention

Dizziness: cardiac changes

Blurred vision

Hand tremors

Constipation

Nausea

Monoamine Oxidase Inhibitor (MAO-I)

Generic

Phenelzine

Tranylcypromine

Isocarboxazid

Selegiline/L-deprenyl

Brand

Nardil

Parnate

Marplan

Eldepryl

MAO-I: Physiologic Action

- MAO-I inhibits mono amine oxidase- an enzyme that breaks down neurotransmitters.
- MAO-I prevents the break down of neurotransmitters thus enhancing their level at the synapse.

Monoamine Oxidase Inhibitor (MAO-I)

- Side Effects

Dizziness: cardiac changes

Stomach upset

Dry mouth

Constipation

Headache

Blepharospasm

Monoamine Oxidase Inhibitor (MAO-I)

- 'Side Effects' special consideration:
Non-Compliance with Dietary Restriction

Hypertensive crisis:

throbbing headache; palpitations; neck soreness; pallor; chills; nausea; vomiting; restlessness; chest pain; fever-
can lead to stroke, coma, death

SSRI Antidepressants

- Selective Serotonin Reuptake Inhibitor

- Generic Brand

Fluoxetine Prozac

Sertraline Zoloft

Fluvoxamine Luvox

Citalopram Celexa

Escitalopram Lexapro

Paroxetine Paxil

SSRI Course Of Action

- Blocks the reuptake of serotonin at the synapse
- Allowing for the gradual 're-accumulation' of serotonin at the synapse

SSRI Antidepressants

- Side Effects:

- GI symptoms (nausea, diarrhea)

- Headache

- Anxiety, nervousness, panic

- Sleep disturbance

- Restlessness, irritability, and agitation

SSRI Antidepressants

- Side Effects (continued):
 - Sedation, fatigue
 - Dizziness or lightheadedness
 - Sexual dysfunction
 - Tremor
 - Dry mouth
 - Sweating

SSRI Antidepressants

- Side Effects (continued):

- Precipitation of mania

- Weight loss/gain

- Rash

- Bruising/bleeding

- Seizures

SSRI Side Effects (continued)

Special Considerations

- Agitation vs. akathesia vs. mania
- Withdrawal syndrome
- Serotonin syndrome:
flushing; sweating; agitation; muscle twitches; GI side effects

Novel Antidepressants

Generic

Venlafaxine

Nefazodone

Trazadone

Mirtazapine

Bupropion

Brand

Effexor XR

Serzone

Desyrel

Remeron

Wellbutrin
(SR/ XL)

Black Box Warning

- 'Black Box Warning' and current state of practice: providing treatment with close monitoring

Mood Stabilizers

- Lithium Carbonate
 - Anticonvulsants

Mood Stabilizers: Lithium Mode Of Action

- Action unknown but probably interferes with the ionic pump mechanisms in the brain cells
- May compete with or replace sodium ions
- In turn (the above) alters chemical transmitter in the CNS

Lithium Carbonate

- Side Effects:

Nausea

Fine hand tremor

Increase urination

Diarrhea

Upset stomach

Increased thirst

Decreased appetite

Toxic Effects

- Slurred speech
- Increased hand tremor
- Sluggishness
- Ringing in the ear
- Vomiting
- Uncertain gait
- Confusion
- Blurred vision
- Excessive thirst

Mood Stabilizers: Anticonvulsants

Generic

- Carbamazepine
- Oxcarbazepine
- Valproate/Divalproex
- Lamotrigine
- Topiramate
- Gabapentin

Brand

- Tegretol
- Trileptal
- Depakote
- Lamictal*

- Topamax
- Neurontin

- (*Steven-Johnson syndrome)

Mood Stabilizer: Mode Of Action For Anticonvulsants

- Unknown, but anticonvulsants may work by one or both of the following:
 - increasing the activity of neurotransmitter GABA which blocks the firing of neurons
 - blocking action of glutamate - an excitatory transmitter

Depakote

- Irritability
- Hair loss
- Reduces platelets: easy bruising
- Liver toxicity (first 6 months/children)
- Pancreatitis
- Possible Polycystic Ovarian syndrome:
monitor androgens and menstrual history

Benzodiazepines

Generic

Lorazepam

Clonazepam

Alprazolam

Chlordiazepoxide

Diazepam

Brand

Ativan

Klonopin

Xanax

Librium

Valium

Benzodiazepines

Anxiolytic, hypnotic, anticonvulsant,
some muscle relaxant properties

- Mode of action: GABA
- Most Common side effects:
 - Drowsiness
 - Sedation

Buspirone

Non-benzodiazepine Anxiolytic

No direct effect on GABA receptors

Side Effects:

- Restlessness
- GI distress
- Headache
- Dizziness

Antipsychotics

Generic

Chlorpromazine

Thioridazine

Mesoridazine

Perphenazine

Trifluoperazine

Fluphenazine

Haloperidol

Brand

Thorazine

Mellaril

Serentil

Trilafon

Stelazine

Prolixin

Haldol

Antipsychotics (continued)

Generic

Thiothixene

Molindone

Loxapine

Clozapine

Risperidone

Olanzapine

Sertindole

Brand

Navane

Moban

Loxitane

Clozaril

Risperdal

Zyprexa

Serlect

Antipsychotics: Mode Of Action

- Unknown: most likely blocks post-synaptic dopamine receptors
- Prevents the dopamine from making 'contact' with the receptor

Antipsychotic Side Effects

- Sedation
- Orthostatic hypotension
- EKG changes
- Anticholinergic
- Extrapyramidal
- Dermatologic: simple allergic; photosensitivity; pigmentary skin changes (long term)

Antipsychotic Side Effects

- Endocrine: amenorrhea; galactorrhea; gyncomastia
- Hematologic
- Hepatotoxicity
- Metabolic: weight gain
- Ophthalmologic: cornea and lens changes; pigmentary retinopathy
- Temperature dysregulation: hyperthermia
hypothermia

Antipsychotic Side Effects

Neuroleptic Malignant Syndrome

- muscular rigidity
- elevated temperature
- blood pressure changes
- altered consciousness

Stimulants For The Treatment Of ADHD

Generic

Methylphenidate

Dextroamphetamine

Pemoline

Brand

Ritalin/Concerta/
Metdate/Focalin

Dexedrine/Adderall/
mixed amphetamine salts

Cylert

Duration Of Effect

- Short duration: 2-5 hours
- Medium duration: 4-6 hours
- Long duration: 8-12 hours

Stimulant: Mode Of Action

- All medications in this class enhance dopamine and/or Norepinephrine (NE) in the brain

Side Effects

- Appetite suppression
- Insomnia
- Sadness
- Rebound hyperactivity/irritability
- Long term growth problems

Side Effects

- Tics: exacerbation
- Headaches/stomachaches
- Hepatotoxicity
- Abuse
- Psychotic symptoms
- Mania

'Prudent Practice' Guidelines

- Start with a low dosage and increase gradually.
- Take one medication at a time.
- Educate the patient and family.
- Know the patient's presenting symptoms
 - * Symptoms vs. Side Effects
- Monitor for side effects:
 - * Regular monitoring of medication efficacy and side effects
- Patient and family should be comfortable calling

'Prudent Practice' (continued)

- Educate everyone:
 - know the symptoms
 - potential benefits-specifics
 - possible side effects; when to tolerate and when to stop
 - may add next medication if needed

Adjusting the 'Means of Delivery': future possibilities

- Transdermal patch by and large avoids the contact with the GI tract
- Less disruption of the MAO system in the GI tract with the potential to decrease dietary issues associated with taking an MAO-I
- Opens up prospect for therapeutic benefit of a medication class that was previously prohibitive

The Future

- Matching the medication to the part of the brain generating the symptom
- Yet to be determined where the symptom originates
- Accurate and consistent identification of the symptoms by clinicians

We acknowledge with gratitude the Pennsylvania Legislature for its support of the STAR-Center and our outreach efforts.

This presentation may not be reproduced without written permission from: STAR-Center Outreach, Western Psychiatric Institute and Clinic, 3811 O'Hara Street, Pittsburgh, PA 15213. (412) 687-2495

All Rights Reserved, 2006