

Movement Disorders in Psychiatry

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This talk includes discussion of medications that have not received FDA-approval..

Dr. Golombek has no financial relationships relevant to this talk.

- This talk includes discussion of medications that have not received FDA-approval for use in children with tics and/or Tourette syndrome.
- Currently the only two medication with this approval are Haloperidol and Pimozide.

Movement Disorders

- Many movement disorders associated with psychiatric conditions or adverse effects of psychiatric medications.
 - Tics, Tourette
 - Tremors
 - Stereotypies
 - Akathisia
 - Dystonia and Dyskinesia
 - Chorea
 - Compulsions
 - Conversion, etc.

- This talk will focus on:
 - Tics and Tourette
 - The treatment of tics, Tourette and common comorbid conditions
 - The adverse effects associated with the psychotropic medications often used to treat tics, Tourette and comorbid conditions

Tics

- Definition of a tic: non-rhythmic, repetitive, intermittent muscular contractions that results in stereotyped movements. (Zinner, 2010, p.224)
- Simple: sudden, brief, meaningless movement that are isolated to a muscle group
 - Motor: blinking, opening eyes widely, nose twitching, lip movements, grimaces, jaw snaps, neck jerks, clenching or jerking other areas.
 - Phonic: grunting, sniffing, throat clearing, coughing, sucking, hissing, tongue-clicking, barking, chirping, whistling. (Zinner, 2010, p.225)

Tics

- Complex: often slower, longer and may appear purposeful.
- Motor: head shaking, trunk flexion, finger tapping, waving or reaching, making vulgar gestures, jumping, kicking, stomping. Can also be appear as exaggerated facial expressions or body postures, imitative gestures, or behaviors (lip-licking, finger-pulling, or neck-snapping) than can cause self-harm.
- Phonic: syllables, words, or phrases; obscenities or uncouth observations; imitative expressions; or unusual speech (changes in meter, pitch, repeating, or blocking.)

(Zinner, 2010, p.225)

Differential Diagnosis for Repetitive Behaviors

- Habits, Mannerisms, Allergies, Compulsions, Conversion, Stereotypies, Perseverative behaviors, Self-injurious behaviors, Tremors, Chorea (Sydenham's chorea), Athetosis, Myoclonus, Spasms, Dystonias, Dyskinesia, etc.

(Walkup, 2006; Zinner, 2009)

Tic Disorder and Tourette

- For the following tic disorders, onset is before the age of 18 and tics need to be present on a near-daily basis. They are not secondary to a substance or medical condition.

Of note, the disorder does not have to cause significant distress or dysfunction for diagnosis.

- Transient tic disorder: present for 4 weeks to 1 year.
- Chronic motor or vocal tic disorder: present for more than 1 year. Motor are more common than vocal and vocal are more likely to be simple than complex.
- Tourette Disorder:
 - Multiple motor and at least one vocal tic on a near-daily basis and lasting at least 1 year. (Singer, 2010, p.41; Zinner 2010)

Other Tic Disorders

- Tics disorders that do not meet criteria.
- Tics caused by medical or neurological conditions:
 - Drugs and toxins
 - Strokes, head trauma, seizures, neoplasms
 - Infections and post-infections
 - Neurodegenerative disorders (Huntington's, Creutzfeldt-Jacob disease, neuroacanthocytosis, Patnothenate kinase-associated neurodegeneration PKAN))
 - Other neurological disorders (Wilson's, Neurocutaneous disorder.)
 - Chromosomal disorders (Trisomy)
 - Neurodevelopmental disorders (Autism Spectrum Disorders, Intellectual Disability)
 - PANDAS (assuming it exists). (Zinner, 2010; Singer, 2010, p. 41)

Frequency of Tics & Tourette

- Tics, specifically transient motor tics, may in occur in up to 25% of all children.
 - May be a part of normal development.
 - Often not apparent if insufficiently frequent or severe.
- Tourette Disorder
 - Estimated at 1% with prevalence in boys four times that of girls. (Zinner, 2010)

Onset of Tics

- Onset: mean age is between 5 and 7 and most will develop tics before teen years.
- Maximum severity: typically occurs between 8 and 12 years old.
- Typically, tics decline with age and most kids do well by the time they are in their 20's.

(Singer, 2010, p.42; Walkup 2006)

The Nature of Tics

- Tics **WAX** and **WANE**.
- Often occur in bouts over time.
- Morph or change location, frequency, type, complexity, and severity over time.
- Tend to evolve from:
 - Simple to complex
 - Front (rostral) to back (caudal)
 - Middle (midline) to side (peripheral). (Zinner, 2009 & 2010)

The Ups and Downs

- Tics may worsen with excitement, stress, anger, fatigue, or infections, but is not caused by stress.
- Tics may improve when an individual is happy, focused, or sleeping.
 - Of note, while most parents report tics abate with sleep, polysomnograms show tics can be present in all phases of sleep.

(Singer, 2010, p.40)

The Itch to Tic

- Tics are often preceded by a premonitory urge or sensation described as an urge, tension, pressure, itch, or feeling.
- Described by 90% of adults and 37% of children.

(Singer, 2010, p.40)

- The ability to identify this urge or sensation is key to cognitive-behavioral therapies designed to treat tics.

Suppressing the Tic

- Tics may be suppressed for brief periods of time.
- However, the premonitory sensation or internal tension that occurs prior to a tic often increases with suppression, but resolves when the tic occurs.

(Singer, 2010, p.40)

- Sometimes see a rebound effect of increased tics after a period of suppression (for instance, after church or school.)

Pathophysiology of Tic Disorders

- Cause of tics/Tourette is unknown.
- Data supports dysfunctional filtering or gating mechanism that results in urges to perform elements of useful actions, but in inappropriate ways or times.
- Brain areas implicated: Basal Ganglia (caudate, putamen, globus pallidus, subthalamic nucleus, substantia nigra), cortex (deficits in inhibition and executive function) and midbrain.
- Neurotransmitters implicated: dopamine, serotonin, and glutamine among others.

(Zinner, 2010; Singer, 2010, p44-47)

Genetic Influences

- Inheritance pattern is not clear, but there is a strong genetic component:
 - For chronic tic disorder, there is an 86% concordance with monozygotic twins, but only a 20% concordance in dizygotic twins.
- Data suggests possible autosomal dominant transmission with incomplete penetrance, complicated by other factors, including possible environmental factors.

(Singer, 2010, p.43-44)

(Zinner, 2010)

PANDAS: in Theory

- PANDAS is Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal infection.
- In theory, this is a sudden onset of tics and/or Obsessive Compulsive Disorder (OCD) symptoms in pre-puberty associated with a beta-hemolytic strep infection, and accompanied by other neurological signs (hyperactivity and choreiform movements), and characterized by an episodic “sawtooth” course.

(Zinner, 2009; Singer, 2010, p.44)

- However, the science is far from robust.

PANDAS: In Practice

- In practice, we do nothing differently.
- For strep infection: culture if suspected, treat if diagnosed, and follow-up culture 5 days after completion of antibiotics to be sure it's gone.
- Don't check strep titers, use prophylactic antibiotics, and don't consider plasmapheresis or IVIG.
- Address OCD and tics as with any case.

(Zinner, 2009; Singer, 2010, p.44)

Co-morbidites

- ADHD, OCD, Anxiety and Depression, Aggression or outbursts, **learning disorders**, and sleep problems are common co-morbidities.

- With Tourette Syndrome:
 - ADHD: 21-90% (@50%)
 - OCD: 20%-89%
 - Anxiety & Depression: 19-80%.
 - Anger, outbursts, aggression: 25%
 - Sleep Disorders: 20-50%.

(Singer, 2010, p. 42-43, Zinner, 2010)

Treating Tic Disorders

EDUCATION

AND

ADVOCACY

For Child, Family, and School

Treating Tic Disorders

- Nature and course of tics, including that tics generally get better without an intervention.
- Tics do not need to be treated unless they significantly affect function.
- Therapy can be as effective as medications.
- Comorbid conditions (ADHD, OCD, aggression) are usually a greater barrier to function than tics.

Resources

- Dr. Zinner's website: <http://depts.washington.edu/dbpeds>, then select Resources, then Tic Disorders/Tourette Syndrome
- Includes:
 - Video: “Newly Diagnosed,” “What Makes You Tic,” and educational links.
 - Habit Reversal Therapy guidelines
 - School care plan.
 - Treatment of Aggression (video)
 - Links to Tourette Syndrome Association and local chapters.
 - Link to Planet Tic and Yale newsletter, “In The Loop”

Resources

- Tourette Syndrome Association: www.tsa-usa.org
 - Educational videos on tic disorders and co-morbid concerns such as impulse control and aggression and executive dysfunction.
 - Educational programs and videos including those for school in-service programs, explanation of IEP's and 504 plans, and resources for bullying.
 - Study information (ongoing genetic study)
 - Support for children including video's about having Tourette Syndrome, and how to become a Youth Ambassadors.

Treatment: School

- Education and Accommodation in school:
 - Education of teachers and staff—see in-service programs through the Tourette Syndrome Association at <http://www.tsa-usa.org>
 - Use of tic breaks, opportunities for movement, accommodations for learning and testing accommodations.
 - Tourette Syndrome designated an “Other Health Impairment,” eligible for special education services under Individuals with Disability Act. See <http://idea.ed/gov>
 - Also see Education/Education Advocacy link at <http://www.tsa-usa.org>
 - Bullying: www.stopbullyingnow.hrsa.gov and resources at www.tsa-usa.org

TSA website)

(Zinner, 2009;

Treatment: Therapy

- Effective treatments drawn from Cognitive Behavioral Therapy:
 - Habit Reversal Therapy
 - Multiple studies, including at least 6 randomized controlled trials of both adults and children.
 - Nearly all showing a significant reduction in tic frequency and/or severity with sustained gains over time.
- (Himle, 2006)
- CBIT
 - Recent multicenter randomized controlled trial.

Habit Reversal Skills

- Increase child's awareness of when the tic occurs:
 - Have child identify the movement and muscles involved by watching himself in a mirror, identifying when the habit occurs and record the occurrence.
- Practice Competing Response or Behavior:
 - Create a competing response should use muscles that make completion of the tic impossible and practice this in the mirror. Encourage child to use this action when he feels the urge to tic, in situations where tics are likely to occur, and for 1 minute after each time he performs the habit.
- Reinforcement:
 - Praise child when he uses the competing response and when you notice the tic/habit decreasing.
 - **The greatest change occurs in the 2nd-3rd month.**

(Christophersen, Dr. Zinner's website)

CBIT Study

- Comprehensive Behavioral Intervention for Tics (CBIT) draws on Habit Reversal Training to develop awareness of tics, develop a competing response, learn relaxation skills, and receive social support. It also uses Functional Analysis of behavior to identify social situations that may trigger tic
- Recent multi-site, observer-blind, controlled trial of 126 children aged 9-17 years old with Tourette Syndrome or chronic tic disorder. randomized to CBIT or to supportive counseling and education.
- CBIT was delivered as 8 sessions within 10 weeks, with 3-month boosters for responders.

2010; Scahill, 2010; Zinner, 2010)

(Piacentini,

CBIT Results

- Evaluated by Yale Global Tic Severity Scale:
 - CBIT → drop from 24.7 to 17.1
 - Control → drop from 24.6 to 21.1
 - Effect size of 0.68
- Clinical Global Impressions—Improvement Scale.
 - 52% of children rated as very much or much improved vs. 18.5%.
- Gains endured: 87% of Responders to CBIT had continued benefits 6 months after treatment.

2010)

(Piacentini,

Limitations of HRT & CBIT

- Cognitive development: child must be able to identify when a tic is likely occur, ideally the premonitory urge prior to a tic. This ability may not be present in children younger than 9 or 10 years old.
- Lack of well-trained therapists. Degree of training necessary is unclear.
 - Tourette Syndrome Association is offering free training in CBIT conducted by the principle investigators of an NIMH-funded study. This is available through the TSA website: <http://www.tsa-usa.org>

Treatment: Medications

- Tics wax and wane, so can a child ride the wave?
- Tics generally improve after peak severity in middle-school years.
- For most children, the greater dysfunction is caused by co-morbid conditions (ADHD, OCD, learning disorders, behavioral concerns) rather than the tics themselves and outcome is determined by co-morbid conditions vs. tic severity.
- If child is able to learn CBIT/HRT (may be as early as 10 years old) and can find a trained therapist (much harder), reductions in tics is approximately the same (@30%) as medications and without adverse effects associated with medications.

Treatment: Medications

- No medication designed specifically for tic reduction.
- No medication eliminates tics completely.
- Medication studies are typically short (about 4-8 weeks) and include fewer than 50 children. Thus, long-term outcome is unknown. (Piacentini, 2010)
- Only two FDA-approved medication for use in children with Tourette Syndrome, neither one of which would be our first (or second, or maybe third) choice:
 - Haloperidol
 - Pimozide
- All other medications and treatments discussed are off-label.
- Adverse effects are often SIGNIFICANT. Must carefully

Medications for Tics

Effectiveness Categories of Tic-Suppression from Tourette Syndrome Association Medical Advisory Board Treatment Guidelines

- Category A : Effective in 2 or more placebo-controlled studies:
 - Haloperidol (typical neuroleptic)
 - Starting dose: 0.25-5mg; Usual dose: 1-4mg in divided doses.
 - FDA-approved for use in children with Tourette's Syndrome.
 - Pimozide (typical neuroleptic)
 - Starting dose: 0.5-1mg; Usual dose: 2-8mg in divided doses.
 - FDA-approved for use in children with Tourette's Syndrome.
 - Risperidone (atypical neuroleptic)
 - Starting dose: 0.025-0.5mg; Usual dose: 1-3mg in divided doses.

(Gilbert, 2006, Lyon 2010)

Medications for Tics

Effectiveness Categories of Tic-Suppression from Tourette Syndrome Association Medical Advisory Board Treatment Guidelines

- Category B: Effective in 1 placebo-controlled trial:
 - Clonidine (alpha-2-adrenergic agonist)
 - Starting dose: 0.025-0.05mg; Usual dose: 0.1-0.3mg
 - Guanfacine (alpha-2-adrenergic agonist)
 - Starting dose: 0.5-1.0mg; Usual dose: 1.0-3.0mg
 - Ziprasidone (atypical neuroleptic)
 - Starting dose: 5-10mg; Usual dose 10-80mg

- Other trials include Botulinum Toxin, Tiapride, Fluphenazine, and possibly Topiramate.

(Gilbert, 2006; Lyon 2010; Singer, 2010)

Medications for Tics

Effectiveness Categories of Tic-Suppression from Tourette Syndrome Association Medical Advisory Board Treatment Guidelines

- Category C: Effective in an open-label study:
 - Olanzapine (atypical neuroleptic)
 - Starting dose: 2.5-5mg; Usual dose: 2.5-12.5mg.
 - Nicotine Patch
 - Starting dose: 7mg; Usual dose: 7-21mg.
 - Baclofen
 - Starting dose: 10mg; Usual dose 40-60mg
 - Tetrabenazine
 - Starting dose: 25mg; Usual dose 37.5-150mg
 - Abilify
 - Starting dose 1.25-2.5mg; Usual dose 1.5-8.5mg
 - Other options: Mecamylamine, Sulpride, Clonazepam)
(Gilbert, 2006; Lyon, 2009; Lyon 2011; Singer 2010)

Medications for Tics

Improvement for Selected Medications Showing Superiority to Placebo
(percentage is NOT adjusted for placebo)

- Haloperidol: 64% (FDA-approved)
- Pimozide: 39-58% (FDA-approved)
- Risperidone: 35-50%
- Clonidine: 35%
- Guanfacine: 30-37%
- Ziprasidone: 35%
- Botulinum Toxin: 40%

(Scahill, 2006. Lyon 2010)

Medications for Tics: Recommendations for Primary Care

- Most benign for adverse-effects:
 - Guanfacine (Tenex) and Clonidine
 - Both are alpha-2-adrenergic agonists
- May also be useful for some ADHD symptoms (although not FDA-approved for the treatment of ADHD.) May also help with aggression and insomnia.
- Adverse effects include sedation, lightheadedness. Need to monitor for blood pressure and heart rate. Avoid abrupt discontinuation owing to potential for rebound hypertension. Use with caution if also using stimulant.
- **May need up to 2 months to achieve benefit.**
- **If this fails, please consult PAL to discuss further options, most likely atypical neuroleptics.**

(Gilbert, 2006; Zinner, 2010)

Other Investigational Treatments

- Neurosurgery: few, complicated cases with mixed results.
- Deep-Brain Stimulation: limited case studies, lack of clarity as to exact anatomical target, requires working with programmer to fine-tune stimulation over many months, mixed results.
- Transcranial Magnetic Stimulation—ongoing studies.
- Nutritional Supplements:
 - In a recent survey, 88% of children with Tourette syndrome had tried nutritional supplements despite lack of evidence (typically case-studies.)
 - Ongoing studies for Tourette and fish oil and N-acetylcysteine among others.

In The Loop, 2010)

(Walkup, 2006; Smith, 2010, Richardson, 2005, Zinner, 2009;

Co-Morbidities

- ADHD, OCD, Anxiety and Depression, Aggression or outbursts, learning disorders, and sleep problems are common co-morbidities.
 - ADHD: 21-90% (@50%)
 - OCD: 20%-89%
 - Anxiety & Depression: 19-80%.
 - Anger, outbursts, aggression: 25%
 - Sleep Disorders: 20-50%.

- **Tic Disorder outcomes are predicted not on severity of tic disorder, but on presence of co-morbid conditions.**

(Singer, 2010, p. 42-43, Zinner, 2010)

ADHD

- Very frequent co-morbidity and often far more impairing than tics.
- Somewhat different presentation in children with tic disorders with increased emotional, behavioral, and psychosocial difficulties as well as impairments in learning and function. (Singer, 2010, p.42)
- Stimulants are the most effective treatment for ADHD, but 1983 warning by stimulant manufacturers that states stimulants were contraindicated in the presence of tic disorders or a family history or Tourette's syndrome.

(Bloch, 2010)

Why the Contraindication?

- Collection of case-reports and case series, beginning in 1963, which associated the onset of tics and the exacerbation of existing tics with methylphenidate, dextroamphetamine, and pemoline.
- Also, this made some sense given the hypothesis that tics were associated with increased dopamine in the basal ganglia; the fact that stimulants increase dopamine; and the fact that dopamine-antagonists (neuroleptics) were effective in reducing tics.
- However:
 - The natural onset of ADHD and tics are close in time, with onset of ADHD prior to 7 years and onset of tics around 7 years.
 - Recent meta-analysis of ADHD medications does not support this.

Zinner, 2010)

(Bloch, 2010;

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Review of 9 studies, with 477 subjects, 177 of whom were in crossover studies.
 - 4 studies (199 subjects) compared Methylphenidate-derivatives vs. Placebo
 - 3 studies (134 subjects) compared Alpha-agonists vs. Placebo
 - 2 studies (75 subjects) compared desipramine with placebo (owing to cardiac arrhythmias, not frequently used.)
 - 1 study (145 subjects) compared atomoxetine (Strattera) vs placebo.
 - 1 study (15 subjects) compared deprenyl vs. placebo (not available in US, similar to l-depreynyl (Seligiline), a MAO-B inhibitor—don't use)

(Bloch, 2010)

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Methylphenidate studies showed superior efficacy in treating:
 - ADHD inattentive symptoms (ES 0.41)
 - Hyperactivity/Impulsivity symptoms (ES 0.82)
 - Improved tic symptoms (ES. 0.28), but with much heterogeneity.
 - Tourette Syndrome Study Group Study (longer), showed greater effect size.
 - Differences in doses (0.5mg/kg bid to 1.2mg/kg bid) did not seem to affect tic severity.

(Bloch, 2010)

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Amphetamine studies:
 - One crossover study with 12 boys with ADHD and Tourette Syndrome.
 - Dextroamphetamine 7.5mg to 22.5mg bid, with highest dose at 1.28mg/kg/day (above recommended maximum.)
 - Results:
 - Tic severity significantly at high doses.
 - At lower doses (0.82mg/kg/day) there was either reduced tic severity or no change in tic severity.

(Bloch, 2010)

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Alpha-2 Agonists, 2 studies on clonidine, 1 on guanfacine:
 - Significantly improved tics (ES 0.74)
 - ADHD inattention symptoms (ES 0.76) but did not reach significance owing to differences in the two studies (different medications, duration, measurements)
 - ADHD hyperactivity/impulsivity symptoms (ES 0.75)
 - This said, neither guanfacine nor clonidine is FDA-approved for the treatment of ADHD.
 - Sedation was common adverse effect (clonidine 48%, guanfacine 41%), but often decreased with continued use.
 - Potential risk of rebound hypertension if suddenly stopped.

(Bloch, 2010)

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Atomoxetine (Strattera) study:
 - 148 children in a 16 week parallel-group study compared Atomoxetine with placebo.
 - Results:
 - Significant improvement in tics (ES 0.32)
 - ADHD symptoms combined (0.51)
 - Greater nausea and decreased appetite compared to placebo.
 - No long-term use data.

(Bloch, 2010)

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Take Home Message:
 - Treat the ADHD if it is causing functional impairments.
 - Methylphenidate typically more effective for ADHD symptoms, and may reduce tics.
 - Alpha-2-agonists are more effective in reducing tics, and may help some ADHD symptoms.
 - Amphetamines may exacerbate tics if at higher than recommended doses.
 - Atomoxetine is a reasonable option, but works less well on ADHD than methylphenidate and is no better for tics.

(Bloch, 2010)

Meta-Analysis of ADHD Medications in Children with Tic Disorders

- Must educate families regarding risks and benefits, especially in light of warnings and make a careful decision.
- If tics worsen with start of stimulant trial, may consider stopping it and see if tics decrease. Typically, if increase is related to stimulant, they will.

Obsessive-Compulsive Disorder

- Estimated prevalence in children with Tourette syndrome is 20-89%. (Singer, p.42-3)
- Obsession: intrusive, disturbing, unwanted thoughts, images, or impulses. In adults, are ego-dystonic. In children, not necessarily so.
- Compulsions: rule-governed behaviors individuals are driven to perform (and often reduce the discomfort of the obsession, for instance, washing after the thought of becoming ill through contamination.)
- In adults, obsessions and compulsions are ego-dystonic. They are aware that, in some manner (intensity, frequency, specificity, etc) they don't make sense.
- In contrast, children are often not aware that these thoughts and actions don't make sense and are less bothered by them than adults.

OCD

- OCD may be somewhat different in individuals with tic disorders with more emphasis on:
 - Repetitive counting, ordering and arranging, symmetry, and tapping, rubbing, and touching are the most common compulsions. Obsessions about germs and illness and compulsions of cleaning occur less often.
- Can be a bit tricky to tease apart from a tic sometimes owing to the fact that both the compulsion and the tic often neutralize or relieve the discomfort of an obsession or an premonitory urge.

et al, 2006)

(Goodman,

Treatment of OCD

- The same.
- CBT, with an emphasis on Exposure Response Prevention Therapy (education, relaxation skills, graduated exposure with lots of practice.)
- SSRI's: Those that are FDA-approved for children with OCD include fluoxetine (>7yo) and sertraline (>6yo).

Outbursts and Aggression

- Lots of reasons for and kinds of aggression:
 - Watch out especially for medication reactions that include activation, disinhibition, paradoxical reactions, and behavioral toxicity.
 - Characterized by excitability, hyperactivity, agitation, irritability, mood lability.
 - Can be caused by benzodiazepines, Guanfacine, Steroids, Stimulants, SSRI's, Neuroleptics.

(Budman, 2010)

Outbursts and Aggression

- With Children with Tourette Syndrome, explosive anger and aggression or episodic rage attacks are seen in about 25%
- Abrupt, out-of-proportion aggression, typically impulsive and/or reactive in nature, accompanied by physiological activation, and experienced by child as being uncontrollable and distressing. Often at home and toward parents. Often very remorseful after episode.
- Typically occurs when skills are overwhelmed, rather than being willfully ornery.
- Causes significant morbidity (school placement, issues in the home, and with relationships.)

(Budman, 2010, Himle 2010)

Treating Outbursts and Aggression

- Remember aggression is only a symptom.
- Use a functional analysis of behavior to help clarify. Keep track of frequency, severity, duration, triggers, and context.
- Need to determine what other factors are at play including:
 - Medication adverse effects or interactions
 - Underlying psychiatric disorder
 - Psychosocial stressors at home, school, with peers.

2010)

(Budman,

Treating Outbursts and Aggression Includes:

- Addressing untreated psychiatric disorders.
- Address Psychosocial Stressors.
- Psycho-education, including triggers and reinforcements.
- Parent Skills Training or Behavior Therapy, Family therapy.
- Social Skills Training, Problem-Solving Strategies, and Anger Management
- Anti-bullying
- Physical exercise, nutrition, sleep hygiene.

(Budman, 2010; Himle 2010)

Treating Outbursts and Aggression

- Collaborative Problem Solving with emphasis on:
 - where the behaviors occur (at home), to whom they are directed (often at mom.)
 - Child's characteristics (emotion regulation, problem-solving, frustration tolerance.)
 - Parents characteristics (inflexibility, frustration tolerance, parenting skills, psychological health.)
 - Focus on fit between child and parent, teaching parent to recognize and appreciate child's characteristics.
 - Teach, model, and respond in a way that doesn't provoke frustration and collaboratively problem-solve.

(Himle, 2010)

Medications Used to Treat Outbursts and Aggression

- Consider only as adjunct to therapy.
- Multiple medications have been tried, including atypical neuroleptics, SSRI's, Anticonvulsants/Mood Stabilizers, Stimulants, Clonidine, Propranolol, etc.
- Trials with children with Tourette Syndrome include:
 - Risperidone, Aripiprazole, and Olanzapine.

2010)

(Budman,

Drug-Induced Movement Disorders

- Can occur with many psychiatric medications: neuroleptics, SSRI's, stimulants, mood stabilizers/AEDs.
- Can be characterized by time course:
 - Acute: abnormal movements occur at onset or dose increase.
 - Chronic: abnormal movements occur early or insidiously and persist.
 - Tardive: movements emerge after prolonged treatment.
 - Withdrawal: movements emerge after discontinuation or dose increase)

(Singer, 2010, p.232-4)

DIMD with Dopamine Antagonists

- Typical neuroleptics: Haloperidol, Fluphenazine, Pimozide, Chlorpromazine, Perchlorpromazine, Metoclopramide.
- Atypical neuroleptics: Risperidone, Aripiprazole, Olanzapine, Quetiapine, Ziprasidone.
- Most movement disorders are transient and abate with discontinuation of medication.
- Very different estimates of prevalence.

(Singer, 2010, p. 232-234)

DIMD with Dopamine Antagonists

- Study of 424 pediatric psychiatry patients over 3 years. Was real world study with standardized movement disorder scales. Of note, 80% of children receiving antipsychotics had no psychosis. Most were diagnosed with mood disorders and ADHD.
- 118 children (ages 5-18) had long-term neurological complications that lasted 6 months or more:
 - 9% (11/118) showed tardive dyskinesia (TD) vs. 0 in placebo.
 - Risk increased with duration of use (3% at 6-12 months to 14% at 3 years.)
 - Increased risk in African-American children.
 - Increased if on atypical and typical (27% vs atypical only 6%.)
 - Concurrent use with stimulants (68%), antidepressants (75%), mood stabilizers (75%.)

(Singer, 2010, p. 232-234)

DIMD with Dopamine Antagonists

- Types of DIMD:
 - Acute: dystonia (can look somewhat like a seizure), oculogyric crisis and akathisia, rarely laryngeal dystonia which can be life-threatening
Chronic: subtle dystonia, tremor, rigidity
 - Tardive: dyskinesias, stereotypies, tics, dystonia, and oculogyric crisis
 - Withdrawal: dyskinesias, among others.
- Use AIMS to help identify.

2010, p. 232-234)

(Singer,

Neuroleptic Malignant Syndrome

- NMS
 - Fortunately rare in children
 - Can be life-threatening
 - Typically occurs with start or increase of dose, usually with neuroleptics
 - Characterized by:
 - Autonomic Instability (fever, tachycardia, tachypnea, diaphoresis)
 - Muscle rigidity, bradykinesia, rhabdomyolysis, increased creatine kinase, with threat of renal damage
 - Mental status changes (confusion)
 - Treatment
 - Stop the neuroleptic!
 - Supportive care (typically hospitalized) including hydration and fever reduction, sometimes use of bromocriptine and dantrolene

(Singer, 2010, p. 236)

Also Consider:

- Malignant hyperthermia:
 - Fever, muscle contractions.
 - Can be seen with anesthesia.
- Serotonin Syndrome:
 - Can occur with SSRI or when SSRI is combined with another serotonergic medication such as Triptans.
 - Characterized by:
 - Neuromuscular excitation (hyperreflexia, tremor, clonus, myoclonus, shivering)
 - Autonomic stimulation (fever, tachycardia, diaphoresis, flushing, diarrhea)
 - Mental status changes (confusion, anxiety, agitation)
 - In children, full syndrome is rare. Typically manifests with some degree of hyperreflexia and tremor.
 - Treatment, if severe, entails stopping SSRI and supportive care. If mild, don't increase dose further; rather decrease or better yet, stop.

(Singer, 2010, p. 236)

Akathisia

- Intense or unpleasant feeling or internal restlessness, can't be still. In Greek, it means "inability to sit"
- Can be caused by neuroleptics and, to much lesser extent, SSRI's. Also seen in Parkinson's.
- Treatment:
 - Stop or reduce dose of neuroleptic.
 - Anticholinergics, beta-blockers (propranolol), clonidine, are sometimes used if discontinuation of treatment is not a reasonable option.

(Singer, 2010, p. 236)

DIMD with Dopamine Antagonists

- Mechanism: likely related to dopamine receptor blockade in striatum and imbalance of dopamine and acetylcholine.
- Not sure why some are more affected than others: this does not appear to be related to different D2 receptor polymorphisms, cytochrome p450 variations.
- Vulnerability in some populations does exist, especially in children with ASD. (Singer, 2010, p. 234-235)

Treatment of Dopamine Antagonist DIMD

- Stop or hold neuroleptic.
- Make sure adverse effect is not severe or life-threatening (laryngeal dystonia, oculogyric crisis, NMS) which require emergent care.
- Consult with psychiatry.
 - We sometimes use anticholinergics for tremor and rigidity (benedryl, benztropine), both for treatment of acute dystonia and for treatment of chronic DIMD's.
 - We also sometimes use anticholinergics, propranolol, and clonidine for akathisia.

(Singer, 2010, p. 235-6)

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