

# Impulse-Control Disorders in Tourette Syndrome

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"BY THE TIME I THINK ABOUT WHAT I'M  
GONNA DO...I ALREADY DID IT!"

# Possible Causes of Impulse Control Problems in TS

- Tic phenomenon
- Medical conditions
- Medication side effects/interactions
- Comorbid psychiatric disorders
- Alcohol or substance use

# Tic Phenomena

## Coprolalia:

- Occurs in 8-25% of patients with TS
- Utterance of obscene words/ statements
- Not contextually/socially appropriate

## Copropraxia

- Occurs in 1- 6% of patients with TS
- Grabbing genitals
- Touching others sexually
- Pelvic Thrusting
- Picking at buttocks
- Obscene gestures

# Tic Phenomena

## Self-Injurious Behaviors (SIB):

Occur in 17-22% of patients with TS

head banging

slapping

self-biting

hitting

punching

orifice digging

pinching

picking

# Tic Phenomena

## Trichotillomania:

- Occurs in 0.02 – 3.0 % patients with TS
- Repetitive hair pulling resulting in noticeable hair loss from scalp, eyebrows, eyelashes, pubic hair etc
- Experienced as a “tension-reducing behavior”
- More common in TS + OCD than either TS or OCD only
- May respond to dopamine blocking agents and/or HRT

# Medication-Related Impulsivity

## Anti-Parkinson's Medications:

hypersexuality, cross-dressing, exhibitionism  
pathological gambling  
“Punding”

## Dopamine-blocking Medications:

akathisia-related behavioral dyscontrol

## Serotonergic Medications:

agitation  
aggression  
suicidal ideation/gestures

# Psychiatric Comorbidities in TS associated with Impulsivity

- Obsessive Compulsive Disorder: 25-50%
- Non-OCD Anxiety Disorders: 30-40%
- Attention Deficit Hyperactivity Disorder: 50-60%
- Mood Disorders: 30-40%
- Learning Disabilities: 20-30%

# Impulse-Control Disorders Not Elsewhere Classified

- \* Intermittent Explosive Disorder
- Kleptomania
- Pyromania
- Pathological Gambling
- \* Trichotillomania
- Impulse Control Disorders, NOS

DSM-IV-TR

# DSM-IV-TR Diagnostic Criteria for Intermittent Explosive Disorder

- Discrete episodes of failure to resist aggressive impulses resulting in serious assault or destruction of property (**Criterion A**)
- Degree of aggression grossly out of proportion to provocation or stressor (**Criterion B**)
- Aggressive episodes not due to direct effects of a substance, other mental disorder, or general medical condition (**Criterion C**)

# Definition of Rage in TS

- Abrupt, unpredictable episodes of severe physical and/or verbal aggression
- Grossly out of proportion to any provocation
- Experienced as uncontrollable & distressing
- Accompanied by physiological activation

# Rage Symptoms in TS

- Common in clinical settings
- Cause severe morbidity
- Complex etiology
- Treatment often non-specific

# Characteristics of Children with Explosive Outbursts

- Limited capacity for cognitive flexibility/ "rigid"
- Limited repertoire of adaptive skills/ "concrete"
- Extremely low frustration tolerance/ "reactive"
- Emotionally dysregulated / "intense"

# Causes of Aggression in Children

- Delirium
- Seizure disorders
- Head trauma
- Brain tumor
- Neuropsychiatric syndromes
- Toxins

# Causes of Aggression in Children

- Alcohol/Substance Abuse
- Physical/Sexual Abuse
- Pain
- Sleep disorders
- Pre-existing psychopathology
- Medication side effects

# Causes of Aggression in Children

Pre-existing psychopathology:

- Conduct Disorder
- Oppositional Defiant Disorder
- Major Depression
- Bipolar Disorders
- Attention Deficit Disorder

# Causes of Aggression in Children

## Medications:

- Alcohol
- Benzodiazepines
- Steroids
- Psychostimulants
- Guanfacine
- Neuroleptics
- ✓ SSRIs

# Medication-related Aggression

- Medication-induced activation
- Disinhibition
- Paradoxical reactions
- Behavioral toxicity

Sx: Irritability, anger/rage, excitability  
hyperactivity, agitation, lability

# Neurobiology of Aggression

- DA, opioids, androgens, ACTH facilitate sexual behavior & aggression
- Serotonin (5HT) and NE modulate inhibitory responses
  - Disturbances of central 5HT linked with aggression and impulsivity
  - Low central 5HT associated with violence
  - Lesions of PFC or OFC linked with aggression

# Types of Aggression in TS

Proactive/non-impulsive

Reactive/impulsive

# Temper Tantrums

- Occurs < 1/3 children ages 3-12 years
- Most common: ages 3-5 years (75%)
- Least common: ages 9-23 (4%)
- More common: boys > girls (3:1)
- Hx: trauma, seizure, tics, hyperactivity, bedwetting, head banging, sleep problems

**Temper  
Tantrum  
or  
Rage?**



# Distinguishing Rage From Temper Tantrums

## Temper Tantrums

occurs in young children  
"terrible two's"

magnitude of response is  
not severe or dramatic

usually follows an obvious  
frustration or precipitant

*versus*

## Rage Attacks

occurs in older children  
behavior is no longer  
age-appropriate

severe magnitude  
accompanied by  
significant damage to  
property

no obvious or trivial  
precipitant or stressor

**Predatory  
Aggression  
Or  
Rage?**



# Distinguishing Rage From Predatory Aggression

## Predatory Aggression versus Rage Attacks

cruel indifference to  
feelings of others

outburst accompanied by  
**decreased** autonomic activation

capable of empathy for  
others

outburst accompanied by  
**increased** autonomic  
activation

# Treatment of Intermittent Explosive Disorder/Rage Symptoms in TS

- **Diagnosis**
  - medical, psychiatric, neuropsychological
- **Addressing co-morbid conditions**
  - ADHD, OCD, Mood Disorders, ODD, Conduct Disorder
- **Psychosocial function**
  - Home, school, peers
- **Behavioral interventions**
- **Medications**
  - side effects, drug interactions

# Treatment of Rage Symptoms in TS

- ADHD: stimulants, Wellbutrin, Tenex/clonidine, Strattera
- OCD: SSRIs, Anafranil, cognitive behavioral therapy (CBT)
- Major Depression & Anxiety: SSRIs, TCAs, Wellbutrin, Effexor, Cymbalta, Remeron, CBT
- Bipolar Disorder: Lithium, Depakote, Tegretol
- EEG abnormalities & neurological soft signs: anticonvulsants, lithium, Buspar, Inderal
- Learning Disabilities: cognitive/educational training

# Treatment of Intermittent Explosive Disorder in TS

- Atypical antipsychotics:

Risperdal, Zyprexa, Seroquel, Geodon, Abilify

- SSRIs:

Prozac, Zoloft, Paxil, Luvox, Lexapro/Celexa

- Anticonvulsants/Mood Stabilizers:

Lithium, Depakote, Lamictal, Tegretol, Topamax

- Other:

psychostimulants, propranolol, clonidine, Strattera

# How You Perceive Your Child's Behavior Determines How You React and Intervene

- Unmotivated                      *versus*                      Impaired Executive Function
- Attention-Seeking              *versus*                      Needs Help
- Defiant                              *versus*                      Low Frustration Tolerance
- Stubborn                            *versus*                      Inflexible

# Treatment of Intermittent Explosive Disorder/Rage Symptoms in TS

## Behavioral interventions

- Behavior management therapy
  - Relaxation training
- Social skills training
- Cognitive behavior therapy
  - With emphasis on anger management
- Group therapy
- Family therapy

# Treatment of Rage Symptoms in TS

## Non-pharmacological Interventions

- **Motivational Deficit: “Change Strategies”**  
improve motivation to change behavior
- **Skills Deficit: “Acceptance Strategies”**  
improve adaptive compensatory skills to improve behavior

# Treatment of Rage Symptoms in TS

## Contingency Management Methods

1. Reduce positive reinforcement for disruptive behaviors
2. Increase reinforcement for prosocial behaviors
3. Apply punishment contingent on display of disruptive behavior
4. Make parental/teacher use of consequences more predictable, contingent, and immediate

(Barkley 1997)

# Treatment of Rage Symptoms in TS

## Why Motivational /Change Strategies fail?

1. Requires parents/teachers to implement consistent behavioral plan
2. Require child to remain calm, organized, focused & self regulated
3. Require child to anticipate reward/punishment & to recall previous rewards/punishments
4. Requires intact language processing

# Treatment of Rage Symptoms in TS

## Skills Deficits Interventions

1. Emphasis on antecedents versus consequences of rage attacks
2. Identification of situational specificity
3. Anticipation of difficulties in problem solving related to cognitive dysfunction

# Treatment of Rage Symptoms in TS

## Family interventions

- Family education about TS & related disorders
- Reinforcement of parental unity, authority, and parenting skills
- Treatment of co-morbidities in parents and siblings
- Reduction of environmental stimulation

# Neurobiology of Impulse Control Disorders

- Interaction among multiple complex biologic factors
- No simple tools available in studying the physiology of the human brain
  - Functional neuroimaging (PET, SPECT, functional MRT)
  - Animal models
  - Post-mortem studies
  - Pharmacological studies
- Neurotransmitters (chemical messengers in the brain) involved
  - Dopamine
  - Serotonin
  - Norepinephrine
  - Opioids, androgens, ACTH
- Specific areas of the brain involved

# Non-Obscene Socially Inappropriate Behaviors in TS

- Survey of 87 patients
- Questions on demographics, treatment
- Questions on ADHD, OCD, coprolalia, copropraxia, conduct disorder
- 25 questions
- Focus on insults, other socially inappropriate comments or actions

# Non-Obscene Socially Inappropriate Behavior-1

Variable	Insults (%)	Comments (%)	Actions (%)
Reporting behavior	22	5	11
Reporting urge	30	26	23
Frequency of urge			
Daily	43	29	31
Weekly	19	24	31
Monthly	5	5	8
Rarely	33	43	31
Social problems resulting from behavior			
Arguments	30	17	17
School problems	21	13	13
Fist fights	13	8	7
Job problems	9	6	5
Removal from public place	8	6	6
Legal trouble, arrest	5	2	6

# Non-Obscene Socially Inappropriate Behavior-2

Variable	Insults (%)	Comments (%)	Actions (%)
<b>Behavior directed at</b>			
Family member	31	35	28
Familiar person	36	34	30
Stranger	17	19	19
<b>Setting</b>			
Familiar (work, school)	40	34	32
Home	37	33	29
Public (restaurant, bus)	20	20	21

# Non-Obscene Socially Inappropriate Behavior-3

- 40% try to suppress an urge to insult
- 24% try to cover up by saying something different
- Content of insults
  - Weight (30%)
  - Intelligence (30%)
  - General appearance (27%)
  - Breath or body odor (23%)
  - Parts of the anatomy (21%)
  - Male or female anatomy (21%)
  - Race, ethnic background (20%)
  - Height (13%)

# Association between Socially Inappropriate Behavior and Clinical Characteristics

- Insults, other socially inappropriate comments and actions more frequent in younger patients
- Insults more frequent in:
  - Patients with ADHD
  - Patients with coprolalia, mental coprolalia, copropraxia
  - Patients with conduct disorder
- No association of insults and OCD

# Classification and Treatment of Socially Inappropriate Behaviors

- Association with coprophenomena
  - symptoms may fall within the category of complex tics
- Association with conduct disorder and ADHD:
  - part of more general impairment of impulse control
- Lack of association with OCD

# DSM-IV-TR Diagnostic Criteria for Kleptomania

- Recurrent failure to resist impulses to steal objects that are not needed for their monetary value
- Increasing sense of tension immediately before committing theft
- Pleasure, gratification or relief at the time of committing the theft
- Behavior not better accounted for by other Psychiatric Disorder such as CD, mania, Antisocial Personality Disorder

# Kleptomania: Treatment

- Behavioral techniques
- Medications
  - SSRIs
    - Prozac, Zoloft, Paxil, Lexapro, Celexa
  - Tricyclic antidepressants
    - Anafranil, Tofranil, Elavil, Doxepin
  - Mood stabilizers
    - Depakote, Lamictal, Tegretol, Topamax
  - Opioid antagonist
    - Naltrexone

# DSM-IV-TR Diagnostic Criteria for Pathological Gambling

Persistent and recurrent maladaptive gambling behavior evidenced by  $\geq 5$  of the following:

- Preoccupation with gambling
- Need to gamble increasing amounts of money
- Repeated unsuccessful efforts to stop gambling
- Restless or irritable when attempting to cut down
- Gamble as means of escaping problems
- “Chasing One’s Losses”
- Lies to others about gambling behaviors
- Commits illegal acts to finance gambling
- Has jeopardized a significant relationship, job, career because of gambling
- Relies on others to provide money to relieve desperate financial situation

# Pathological Gambling: Treatment

- SSRIs:  
Prozac, Zoloft, Paxil, Lexapro, Celexa, Effexor
- Anticonvulsants/Mood Stabilizers:  
Lithium, Depakote, Lamictal, Tegretol, Topamax
- Opioid antagonists  
Naltrexone

# Pathological Gambling: Treatment

- Behavioral treatments
  - Aversion therapy
  - Systematic desensitization
  - Exposure
  - Imaginal relaxation
  - Stimulus control with relaxation
- Cognitive treatments
  - Focus on modifying dysfunctional thoughts that maintain desire to gamble
- Cognitive-behavioral treatments
  - Combination of interventions

# Case #1

- 1 year old: episodes of screaming, head banging and hitting himself
- 3 years old: dismissed from daycare for aggressive behavior
- 4 years old: times where that although he did not have any hearing problems, “the lights were on but nobody was home”.
- Kindergarten: episodes of throwing head back, eyes blinking, rolling, mouth chattering but aware of his environment
- Also episodes consisting of staring with gaze deviation to the left and loss of responsiveness, and other episodes with arms flailing out, legs bending and then falling to the ground.

# Case #1 diagnosis: tics, aggression, seizures

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- Also episodes consisting of staring with gaze deviation to the left and loss of responsiveness, and other episodes with arms flailing out, legs bending and then falling to the ground.

## Case #2

- 12 year old girl is reported from school to be behaving differently than usual over the last few weeks
- She is more irritable, getting into arguments and unable to contain her impulses
- Also, she has continuous movements of all extremities and facial grimacing.
- Frequent sore throats, the last one approximately 2 months prior.

**Diagnosis: Sydenham's chorea following strep infection**

## Case #3

- 7 year old boy with developmental delay following encephalitis at the age of 1 year presents with complaints of involuntary movements and anger outbursts
- The patient has repetitive hand movements with rolling of the wrist and touching the forehead
- Additionally, he started having anger outbursts resulting in serious assaultive acts

Diagnosis: Static encephalopathy with stereotypies and behavioral problems

# Case #1

Jenna is a 5 year old female with motor & vocal tics, obsessive compulsive symptoms, hyperactivity, irritability, and rage. Family history is significant for alcohol abuse & mood disorder. Medical history is significant for recurrent streptococcal infection with symptom exacerbation and prenatal exposure to varicella.

## Case #2

Diana is a 13 year old female with motor & vocal tics, OCD and ADHD. Recently she has developed increased sexual preoccupations. Past medical history is non-contributory. Family history is significant for TS, ADHD, and OCD. Social history reveals recent sexual abuse by 17 year old stepbrother.

## Case #3

Joey is an 11 year old male with motor & vocal tics, hyperactivity, distractibility, mood lability, obsessive compulsive symptoms, separation anxiety and explosive outbursts. His parents divorced two years ago. Past medical history is non-contributory. Family history reveals mood swings and impulsive behavior in the patient's father who is a former alcoholic.

## Case #4

Jack is a 9 year old boy with motor & vocal tics, oppositional behaviors, hyperactivity, inattention, obsessions, compulsions, and rage. Jack developed hallucinations with fluoxetine and extreme irritability with methylphenidate. Family history is significant for tic disorder, mood disorder, conduct disorder and alcohol abuse.