**Tics and Tourette Syndrome**

**To Treat or Not to Treat?**

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**Tics and Tourette Syndrome**

**a little history**

- Georges Albert Edouard Brutus Gilles de La Tourette, 1885 describes nine patients with "la maladie des tics"  
- 1968 the Shapiro's first describe the successful treatment of TS with haloperidol

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**Famous people who have some features of OCD or Tourette Syndrome**

- Samuel Johnson, Mozart, Howard Hughes, Marc Summers, David Beckham, Tim Howard, Jim Eisenreich, Chris Jackson, David Aldridge, Michael Wolf, Dan Aekroyd, Howie Mandel, and Mel Gibson.

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**Disclosures**

- Lundbeck Scientific Advisory Board  
- About 13 minutes of videos  
- Some examples of coprolalia  
- All of the videos in this presentation are from:  
  - *Principles and Practice of Movement Disorders*, Stanley Fahn, MD, Joseph Jankovic, MD and Mark Hallett, MD, Saunders, 2011  
- And are used with permission from the publisher.

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**Tic classification**

**Provisional Tic Disorder, DSMV**

- A. Single or multiple motor tics and/or vocal tics (A tic is a sudden, rapid, recurrent, nonrhythmic motor movement or vocalization.)  
- B. The tics have been present for less than 1 year since first tic onset.  
- C. The onset is before age 18 years.  
- D. The disturbance is not due to the direct physiological effects of a substance (e.g., cocaine) or a general medical condition (e.g., stroke, Huntington’s disease, or postviral encephalitis).  
- E. Criteria have never been met for Tourette’s Disorder or Chronic Motor or Vocal Tic Disorder.
**Tic classification**

**Chronic Motor or Vocal Tic Disorder, DSMV**

- **A.** Single or multiple motor or vocal tics have been present during the illness, but not both motor and vocal. (A tic is a sudden, rapid, recurrent, non-rhythmic, motor movement or vocalization.)
- **B.** The tics may wax and wane in frequency but have persisted for more than 1 year since first tic onset.
- **C.** The onset is before age 18 years.
- **D.** The disturbance is not due to the direct physiological effects of a substance (e.g., cocaine) or another medical condition (e.g. Huntington’s disease or postviral encephalitis)
- **E.** Criteria have never been met for Tourette's disorder.

http://www.dsm5.org/ProposedRevisions

**Tic classification**

**Tourette’s disorder, DSMV**

- **A.** Both multiple motor tics and one or more vocal tics have been present at some time during the illness, although not necessarily concurrently. (A tic is a sudden, rapid, recurrent, nonrhythmic motor movement or vocalization.)
- **B.** The tics may wax and wane in frequency but have persisted for more than 1 year since first tic onset.
- **C.** The onset is before age 18 years.
- **D.** The disturbance is not due to the direct physiological effects of a substance (e.g., cocaine) or a general medical condition (e.g., stroke, Huntington’s disease, postviral encephalitis)

http://www.dsm5.org/ProposedRevisions

**Common Motor and Vocal Tics**

- **Simple Motor tics:** Eye blinking, eye rolling, eye opening, shoulder shrugging, facial grimacing…
- **Complex motor tics:** Touching, smelling, shaking, jumping, echopraxia, copropraxia…
- **Simple phonic tics:** Throat clearing, sniffing, grunting, clicking, snorting, squeaking…
- **Complex phonic tics:** Echolalia, palilalia…

Common Motor and Vocal Tics

Simple motor tics, facial tics

J. Dooley, Tic Disorders in Childhood, Seminars in Pediatric Neurology (2006)

Common Motor and Vocal Tics

Simple motor tics, shoulder tics

Common Motor and Vocal Tics

Simple & complex motor tics, limb tics
Common Motor and Vocal Tics
Simple & complex motor tics, truncal tics

Common Motor and Vocal Tics
Complex motor tics

Common Motor and Vocal Tics
Simple phonic tics

Common Motor and Vocal Tics
Complex phonic tics

Common Motor and Vocal Tics
Complex motor & phonic tics

Etiologic classification of tics
- Primary causes
  - Transient & chronic tics, Tourette
  - Wilson’s, PANK, huntington’s
- Secondary causes
  - Syndenham’s, encephalitis, CJD
  - Drugs (phenepretine, compazine, metoclopramide; D2-blockers…)
  - Toxins (CO)
  - Developmental disorders (Static encephalopathy, autism)
  - Chromosomal (T21, 9p monosomy, fragileX…)
  - Other (Stroke, TBI, schizophrenia…)
- Related manifestations and disorders
  - Akathisia
  - Compulsions
  - Excessive startle (Jumping Frenchmen of Maine, hyperekplexia)
  - Stereotypies, habits, manerieisms

Jankovic, N Engl J Med (345,16) 2001
Other idiopathic benign movement disorders in children

• Jitteriness: Generalized high frequency tremor associated with excitement or crying.
• Shuddering: Brief bursts of rapid tremor of the head and arms similar to shivers.
• Spasmus nutans: Slow head tremor (nono) associated with horizontal pendular nystagmus.
• Transient idiopathic dystonia of infancy.
• Benign neonatal sleep myoclonus and benign myoclonus of early infancy.

Epidemiology and etiology

• Prevalence (Meta-Analysis of 34 studies):
  – Tourette syndrome 0.77%
  – Boys: 1.06%, Girls: 0.25%
  – Adults: 0.05%
  – Transient Tic Disorder: 2.99%
• Recurrence among first degree relatives:
  – 10% to 15% (Ercan-Sencicke et al. 2010)
  – Twin studies 89 to 94% concordance

What about Genes?

• Neuronal transmembrane molecule: SLITRK1
• L-histidine decarboxylase identified by linkage mapping analysis
• Neuromod1 identified by recurrent CNV

What about PANDAS

• Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal infection: GABHS+OCD+Tics
• Still a matter of debate!
• 2009 case control study of 255 cases with a diagnosis of tics, TS, or OCD. Exposure defined as physician visit for a streptococcal like illness within two years of the first incidence of tics or OCD.
• No evidence of a relationship between SI and tics or OCD

How is the brain affected?

• Ample evidence implicating the frontostriatal circuits.
• Evidence from:
  – Post mortem studies
  – PET and SPECT imaging
• Dopaminergic (abnormal release and reuptake), glutaminergic (GIP), serotonergic (brain stem) and GABAergic circuits

Comorbid Conditions

• ADHD ~ 50%
• OCD ~ 50%
• Sleep-related disorders ~ 20% to 50%
• Site sensitization
• ODD and conduct disorders
• Learning difficulties
• Pervasive development disorder
• Anxiety disorders
Natural Course

- Waxes and wanes.
- Good and bad days.
- Worse with stress.
- Onset typically 2 year or older.
- Peaks between 10 and 12 years old.
- Typically starts improving in the teen years.
- ~50% will outgrow their tics.

Treatment

- 90% of the time reassurance!
- Treat the child NOT the parents!
- Home is safe
- Education: parents and school
- Cognitive behavioral therapy
- Pharmacotherapy
- Botulism toxin injections
- Deep brain stimulation

Habit Reversal Training

- Awareness training: teach the child to detect premonitory signs.
- Competing response: Any active response that is incompatible with the tic. Relaxation techniques may also be taught.
- Social support: prompts and social reinforcement for using the competing response.
- Can be effectively taught in eight 1-hour sessions or less.
- Various studies have shown 38% to 96% reduction in tics.

Pharmacotherapy

- Alpha-2-adrnergic agonists
- Dopamine (D2) receptor antagonists
- Dopamine receptor agonists:
- Presynaptic dopamine depletion:
- Benzodiazepines:
- Antiepileptic drugs

Pharmacotherapy

- Alpha-2-adrenergic agonists: Usually first line
  - Clonidine (Catapres, available in a patch): effective in ~50% of patients, sedating.
    - Start: 0.025 to 0.05mg/d, target: 0.1 to 0.5mg/d
  - Guanfacine (Tenex, Intuniv): as effective, less sedating, longer lasting, but can cause syncope.
    - Start: 0.25 to 0.5mg/d, target: 2 to 4mg/d

Pharmacotherapy

- Dopamine (D2) receptor antagonists:
  - Side effects: weight gain, sedation, anxiety, extrapyramidal movements, tardive dyskinesia.
  - Typical neuroleptics:
    - Haloperidol: Original Shapiro & Shapiro treatment (1968), efficacy 70% to 80%.
    - Pimozide (Orap): ~70% of patients improve, side effect profile slightly better than haloperidol. Can cause arrhythmias (black box warning).
    - Fluphenazine (Prolixin): as effective as haloperidol but fewer side effects.
Pharmacotherapy

- Haloperidol:
  - Start 0.25 to 0.5mg/d, target: 1 to 5mg/d
- Pimozide:
  - Start 0.5 to 1mg/d, target: 1 to 10mg/d
- Fluphenazine:
  - Start 0.5 to 1mg/d, target: 2 to 10mg/d

Pharmacotherapy

- Dopamine (D2) receptor antagonists: Atypical neuroleptics:
  - Side effects: weight gain, sedation, anxiety, extrapyramidal movements, tardive dyskinesia, potential association with DM
  - Risperidone (Risperdal): Reportedly as good as the typicals with fewer side effects: Weight gain, sedation. Tardive dyskinesia not reported at doses<6mg/d.
  - Olanzepine (Zyprexa): As effective as pimozide, weight gain and increases triglyceride levels.
  - Ziprazidone (Geodon): As effective as pimozide, weight gain and increases triglyceride levels.
  - Aripiprazole (Abilify): Effective, extended release in the works.

What about the comorbid conditions?

- ADHD: With stimulants: Basic rule of thumb: 1/3 get worse tics, 1/3 get better, 1/3 no changes.
  - If they get worse it is usually transient.
  - ADHD often has much more morbidity than Tourette!
- OCD: Can be incapacitating, treat with an SSRI for at least three months before switching.
Resources

www.tsa-usa.org

THANK YOU.